# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS

OF THE

## ENTOMOLOGICAL SECTION

OF

## THE ACADEMY OF NATURAL SCIENCES

OF

## PHILADELPHIA

---

**VOLUME XXXIV, 1923**

PHILIP P. CALVERT, Ph.D., Editor
E. T. CRESSON, Jr., Associate Editor

---

HENRY SKINNER, M.D., Sc.D., Editor Emeritus

---



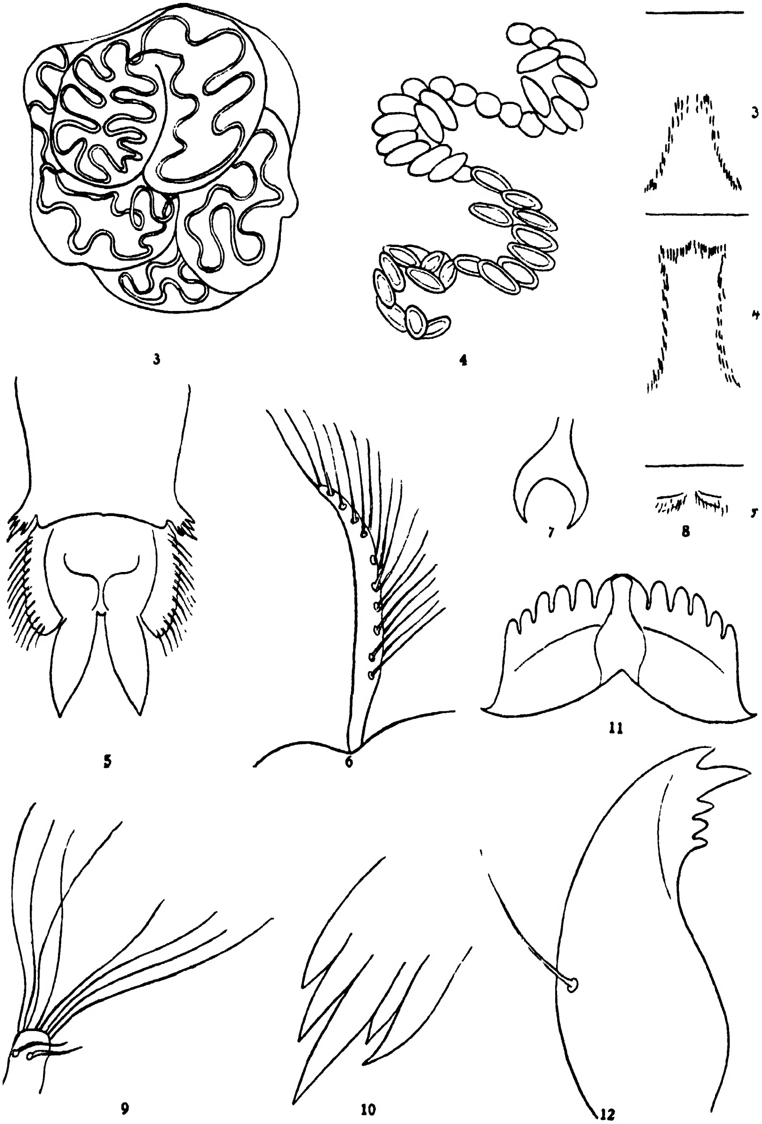
---


PHILADELPHIA, PA.:
Logan Square
1923

The several numbers of the NEWS for 1923 were mailed at the Post Office at Philadelphia, Pa., as follows:

| | | |
|---|---|---|
| No. | 1—January | January 3, 1923 |
| " | 2—February | February 10 |
| " | 3—March | March 5 |
| " | 4—April | April 2 |
| " | 5—May | May 4 |
| " | 6—June | May 31 |
| " | 7—July | July 5 |
| " | 8—October | October 5 |
| " | 9—November | November 2 |

The date of mailing the December, 1923, number will be announced on the last page of the issue for January, 1924.




Hazel E Branch

TANYTARSUS FATIGANS—BRANCH.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

VOL. XXXIV  JANUARY, 1923  No. 1


CONTENTS



## Description of the Early Stages of Tanytarsus fatigans Joh. (Dip.: Chironomidae).*


BY HAZEL ELISABETH BRANCH.


(Plate I)

Egg masses of a Chironomid, which later proved to be *Tanytarsus fatigans* Joh., were found in April upon the baffle board of a sluice at the Fish Hatchery of Cornell University.

As the early stages of this species are as yet undescribed, the following may be of interest to Entomologists.

The egg masses were found above the water level, but in situations where the spray of the flowing water kept them moist. Swarms of adults were seen about these places from April fifth to twenty-second and egg masses were numerous during this period.

Upon being floated in water, the masses freed themselves from each other and showed their individual size and shape. Each single mass is a disc of approximately 5 mm. in diameter,

*A contribution from the Limnological laboratories, Cornell U.

(Pl. I, Figure 3). In the transparent gelatinous matrix of this mass is a rope of eggs about two eggs wide and two eggs deep. This rope curves back and forth, up and down in this shallow disc as illustrated in Figure 3, there being 435 to 450 eggs in one mass. The eggs are pale cream color and opaquely transparent. They measure 0.175 mm. to 0.182 mm. in length and 0.077 mm. to 0.105 mm. in width. No definite period of incubation can be given, as no egg laying was observed, but the period is at least three days, as those eggs taken on April 5th hatched April 8th.

The newly hatched larva is pale like the egg color and measures 0.49 mm. in length. The head capsule is 0.07 mm. in length and the antennae are 0.0875 mm. in length from the base of the first joint to the tip of the antennal filaments. The antennal length in this stage is greater in relation to the head than in the later stages. There are four anal gills present and the rounded caudal projections bear six hairs each. The anal prolegs bear bifid claws 0.01125 mm. in length. (Pl. I, Figure 7).

The little newly-hatched larvae crawled about the old egg mass for the first day and well in to the second, when they started the task of building their tubes, which were made of silt and particles of dirt. These were not individual as in the later stages but are branched and connected to each other. The tube in which a larva was living was open only at one end, the other end being filled with frass. As the tube became too short, the occupant either built up this identical tube ahead of itself or else cut a hole in the side and built a new tube from the side of the old one. These tubes measured about 1.5 mm. to 2 mm. in width and from 10 to 20 mm. in length.

When five days old the larva measured 0.84 mm. but the head had not changed, indicating that a molt had not taken place. During the next twelve days this took place as at the end of that time two sizes of heads were noticed, 0.175 mm. and 0.28 to 0.35 mm.

At the nineteenth day (April 27th) the third molt and fourth instar were evident. The head measured 0.42 mm. and the larva 5.74 mm.

On the twenty-eighth day a larva pupated and the following day the adult emerged, making twenty-nine days from hatching to emergence.

In a second rearing experiment the hatching occurred April

15th with a head size of 0.07 mm. On the eleventh day the head size changed to 0.157 mm., on the sixteenth day to 0.23625 mm., and on the twenty-seventh day to 0.385 mm., the fly emerging on the thirty-first day after hatching.

The older larvae (beyond the second instar) make tubes of mud and algae and these are more or less erect, the opening being in most cases brought near the surface of the water. The food of the larva is mainly *Scenedesmus caudata, Tetraspora sp.* and several species of *Ankistrodesmus.*

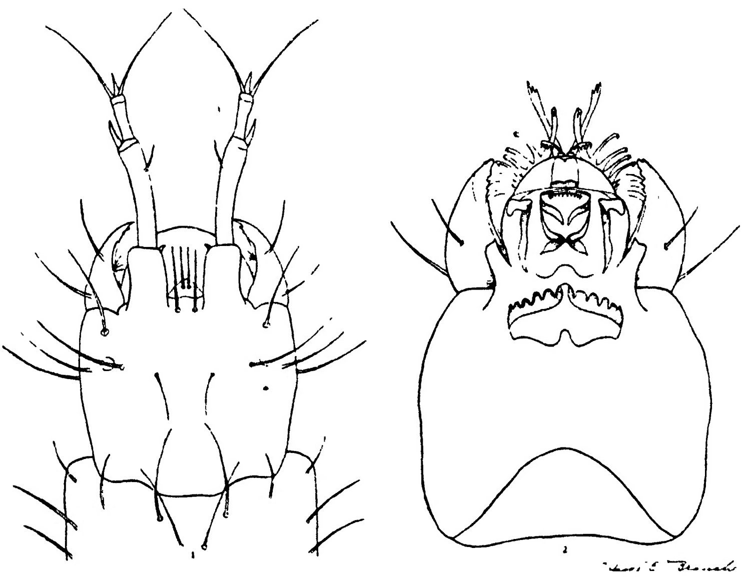


Fig. 1.—Dorsal view of the head. Fig. 2.—Ventral view of the head.
Larva of *Tanytarsus fatigans* Joh.

The length of a *full grown larva* is about 5.74 mm. and the head about 0.40 mm. The antennae are shorter than the length of the head. The larva is pale red in color with the thorax green, due probably to food content, and the peripheral layer of fat is greenish. The penultimate segment does not bear a dorsal hump as in *T. dives* Joh. and the caudal projections are pale with fuscous tips and eight dark hairs each. Upon the dorsal side of these projections are two dark short hairs. (Pl I, Figure 9).

The larva belongs to Bause's *inermipes* group which is characterized by the elongate antennal filaments and the chitinous

point on the inner side of the antennal tubercles. (See Eberhard Bause, Archiv f. Hyrdobiolog. Stuttgart, Suppl.-Bd. II, 1914). The details of the head and appendages are best illustrated by reference to the text figures and Plate I.

The *pupa* is 5.74 mm. in length; with the thorax, head, wing pads and legs fuscous. The dorsum of the abdomen bears setae as illustrated in Pl. I, Figure 8. The respiratory tubercle is pale, transparent and haired (Pl. I. Figure 6). The eighth abdominal segment bears a lateral spur with five teeth, this spur being very dark (Pl. I, Figure 10).

EXPLANATION OF PLATE I.
*Tanytarsus* fatigans Joh.

Fig. 3. Egg Mass.
Fig. 4. Portion of the egg rope.
Fig. 5. Tip of the pupal case.
Fig. 6. Respiratory tubercle.
Fig. 7. Claw of anal proleg.
Fig. 8. Setae pattern on abdomen of pupal case.
Fig. 9. Caudal projection of full grown larva.
Fig. 10. Lateral tooth of pupal case.
Fig. 11. Labium of larva.
Fig. 12. Mandible of larva, ventral view.

## A New Species of Forcipomyia from the Eastern United States (Diptera, Ceratopogonidae).

By J. R. MALLOCH, U. S. Bureau of Biological Survey, Washington, D. C.

On August 14th, 1921, I went to Cabin John, Maryland, to collect insects and shortly after I reached the collecting ground a heavy thunderstorm broke. The rain was so exceptionally heavy and prolonged that the trees did not suffice as shelter more than a few minutes and very soon everything was supersaturated, including my clothes and collecting outfit. While trying to wring the water from my clothes to make things a little more comfortable if possible, I stood under a large beech tree upon the trunk of which there still remained a few dry spots and my attention was attracted to some minute white dots on these areas. A close scrutiny disclosed that they were small ceratopogonine flies and a series was bottled for a more detailed inspection later. This inspection disclosed the fact that the species is undescribed and one of the most strikingly

colored occurring in this country. It is so very small that it was not at any time seen in the net nor elsewhere during the summer though I collected at the same spot frequently.

**Forcipomyia pluvialis** sp. n.

♂ ♀.—Whitish yellow, subopaque. Thorax in male with a dark brown central vitta anteriorly, of female unicolorous yellow; scutellum with a brown spot on each side at base; metanotum brown; pleura darkened below. Abdomen dark on sides, sometimes with a blackish spot on sides of each tergite. Legs usually more or less brownish but sometimes entirely yellowish with tips of tarsal segments dark. Wings clear, with yellow hairs, two large black spots on costa, one at apex of first vein and the other between it and apex, the margin of wing sometimes with a faint dark spot at apex of each vein. Basal segment of hind tarsus subequal to second. Length, .75 mm.

*Type*, male, allotype and 11 paratypes, Glen Echo, Maryland, August 14th, 1921 (J. R. Malloch), in the author's collection.

## A New Empid from the Eastern United States (Diptera).

By J. R. Malloch, U. S. Bureau of Biological Survey, Washington, D. C.

The species described below is slightly different in venation from the genotype, but there are insufficient structural characters to warrant its generic separation.

**Coloboneura exquisita** sp. n.

♂.—Shining rufous yellow, head, disc of scutellum and of metanotum, and the abdomen fuscous. Antennae brownish yellow: palpi fuscous. Mesonotum with two brownish marks on anterior margin. Pleurae and legs whitish yellow. Wings with brownish clouds on each of the longitudinal veins preapically, two blacksh spots behind posterior basal cell, a similar spot in apex of latter close against the cross-vein and one in base of each cell against outer sides of the cross-vein.

Eyes contiguous for a short distance above antennae, third segment of the latter conical, the style thick and nearly as long as third segment. Mesonotum with short black hairs, the notopleural region with some fine setulae, posterior margin with 2 setulae; scutellum with 6 setulae, the apical pair longest. Abdomen tapered, hypopygium small. Legs moderately stout, the hind tibiae with short setulae. Cross veins closing basal cells forming a continuous oblique line; anal vein complete, very close to margin. Length, 1.5 mm.

*Type*, Glen Echo, Maryland, August 28th, 1921 (J. R. Malloch), in the author's collection.

# Odonatological Results of an Auto Trip Across Indiana, Kentucky and Tennessee.

By E. B. WILLIAMSON, Bluffton, Indiana.

In the summer of 1918, Arch L. Cook, of Bluffton, Indiana, and myself planned a trip by auto through Indiana and Kentucky to Tennessee, especially to look for Macromias. We selected the latter part of July and the early part of August as probably the most favorable season, realizing, at the same time, that this season would probably yield scanty returns in general dragonfly collecting. The expedition met with a series of mishaps during its eighteen days in the field and the number of dragonflies collected was small both in specimens and species. At the same time it seems worth while to record our captures and notes, though personally I have never been able to grow enthusiastic over things one doesn't find. Twenty species on a stream are more exciting than two, though the latter record may have some scientific value.

We fitted Mr. Cook's one-seated Ford with a truck body in which we carried two covered folding cots, bedding, some scanty personal effects, a few cooking utensils and some food and the necessary equipment for collecting and for caring for the auto. The load was covered with a heavy tarpaulin and roped down. The seat had no top or cover and we took the weather as it came without protection.

We left Bluffton early in the afternoon of July 21 and camped that night in a school house yard near Lafayette, where an inventory showed us the first day had cost us a burned out bearing and a broken windshield, and the loss of one coat and our water jug. This depletion of our supply was checked and eventually avoided entirely as we grew more proficient in loading and roping our equipment.

Early July 22 our machine hobbled into a Lafayette garage, where we abandoned it for a visit with friends at Purdue University. At 11 A. M. we were again on our way, passing through Wingate and Waynetown and eating our noonday lunch near the covered bridge over Turkey Run. Six to eight miles south of Waynetown a spermophile ran across the

road ahead of us. Along Turkey Run near the covered bridge, the dragonflies *Hetaerina americana* and *Argia apicalis* were common and one *Libellula luctuosa* was seen. After our lunch we visited the Shades,—a new and strange Indiana to a resident from the level portions of the northern part of the state We crossed Otter Creek at the mill north of Terre Haute about 6.45 P. M. and camped that night at Blue Hole, a washout of the Wabash below the level, and a fine place, resembling a large deep, abandoned gravel pit. Our cots were placed on the bank just above the water, and with a good supper, a good swim and clean pajamas life seemed really worth while.

In the morning about Blue Hole, we collected *Lestes rectangularis, Argia apicalis, Enallagma exsulans, Ischnura posita* and *Libellula luctuosa*. About 9 A. M. we reached Middletown (P. O., Prairie Creek), then south to Fairbanks, and then south and west along levees and sloughs to Merom. About two miles west of Merom at a slough or bayou we took *Macromia taeniolata* and *Dromogomphus spoliatus*. From Merom we went to Carlisle, then to Vincennes and from there to Hazelton where we ferried White River and from there, by way of Princeton, arrived at Evansville about 7.15 P. M. That night we camped near Henderson Ferry, and in the morning, July 24th, ferried the Ohio River to Henderson, Kentucky.

Fives miles south of Henderson we saw our first mockingbird. Between Henderson and Madisonville, where we arrived about noon, we saw no ponds or streams except a very small creek two or three miles south of Henderson. Just south of Madisonville is a large lake-like pond, evidently artificial. About its shores grew large areas of *Nelumbo* in full bloom, with the magnificent flowers forming great patches of creamy white color. Sparganium was also abundant. We collected here about an hour and the following dragonflies were taken:

*Lestes rectangularis, Enallagma civile, Ischnura verticalis, I. posita, Anomalagrion hastatum, Anax junius, Epicordulia princeps, Perithemis tenera, Pachydiplax longipennis, Celithemis eponina, Libellula pulchella, L. luctuosa, Plathemis lydia,* and *Tramea lacerata.*

Enroute from Madisonville to Hopkinsville we missed our way

and wandered over atrocious stair-step hill roads and soft mud valley roads through Carbondale, St. Charles and Daniel Boone to Mannington, where we found a splendid road from that town to the fine little city of Hopkinsville. South of Hopkinsville to Clarksville, Tennessee, the pike was badly worn and the recent rains had left long pools of water covering the road in many places. We arrived at Clarksville about 6.30 P. M. and camped that night on the banks of a small creek about five miles west of Thomasville. The feature of our supper was coffee, prepared early that morning in Indiana, transported across western Kentucky and taken hot from the thermos bottle that evening in Tennessee.

In crossing western Kentucky, as mentioned above, we crossed a very small stream two or three miles south of Henderson. The next running water seen was a small river between Mannington and Hopkinsville, and about four miles north of Clarksville we crossed Red River. No other streams were seen. Some creek beds crossed were dry and sandy.

On the morning of July 25 we collected along the creek near our camp of the night before. *Calopteryx maculata* was very common and we found nothing else. About noon we reached the old, familiar and always beautiful Sycamore Creek, at Sycamore, and were soon renewing our acquaintanceship with our old friends, the Jacksons, at whose home I had lived over seventeen years before when collecting on Sycamore Creek. Mr. Jackson kindly placed a log cabin situated in a grove of magnificent white oaks at our disposal, and we hurried through a belated noon lunch to again wade Sycamore Creek. *Calopteryx maculata* and *Hetaerina americana* were abundant, and the *Argias, apicalis tibialis, sedula* and *moesta* were common. A single male *Hagenius brevistylus*, a single male *Erpetogomphus designatus* and a single female *Dromogomphus spinosus* were seen—and all were captured.

July 26 we started in at the road bridge and followed down the creek to below the ford. The day was hazy, cool and windy. We were disappointed in finding no *Erpetogomphus*. During the day we saw possibly twenty *Dromogomphus spinosus* at ripples. Only two *Hagenius brevistylus* were seen, and one of

these, a female, was captured while eating an adult female *Calopteryx maculata*. *Calopteryx maculata*, to judge from its numbers in habitats frequented by cuckoos, vireos, several species of flycatchers, and probably other insectivorous birds, must be immune from attacks by these possible enemies. But its protective character, in the case of birds, seems ineffective against larger species in its own order.

It began raining about 11.30 P. M. and kept it up all night and all day Saturday, July 27. During the day my left eye became very sore and inflamed. Sunday we left Sycamore and went to Nashville and called on Professor C. S. Brown and family at Vanderbilt University. In the afternoon I visited an oculist and learned I had four corneal ulcers on my left eye. The Browns most kindly took us into their home and Monday and Tuesday were spent nursing the sore and throbbing eye, over which, during the entire remainder of the trip I was compelled to wear an eye patch, which prevented my doing any effective collecting.

(To be continued)

## Two New Aberrant Basilarchias from Northeastern United States (Lepid.: Nymphalidae).

By WARO NAKAHARA, New York City.

In the ENTOMOLOGICAL NEWS for June, 1922, I have reported on certain anomalies in wing markings of *Basilarchia astyanax* Fab. (= *Limenitis ursula* Godt.), and expressed the opinion that this butterfly and *B. arthemis* Drury are probably two local races of a single species. If this be true, *B. arthemis* f. *proserpina* Edw., once considered to be a hybrid between *B. arthemis* and *B. astyanax*, must represent a real transition from one to the other; also, one of the two aberrant forms of *B. astyanax* I mentioned in my previous note should be of significance as a further link between the two so-called species. For this reason I am persuaded to propose a name for that form of *B. astyanax*, and to redescribe it. Availing myself of the opportunity, I also commit to the record here an aberrant form of *B. misippus* Fab. (=*Limenitis archippus* Cr.), which I happened to catch during the last season.

**Basilarchia astyanax** ab. **atlantis,** nov. aberr.

Differs from the typical *astyanax* by the presence of a complete submarginal series of fulvous spots on the upper side of hindwing, exactly as in *B. arthemis.*

Length of body, 4/5 inch; expanse of wings, 2½ inches.

*Holotype*: ♂, Elmhurst, Long Island, August 5, 1921 (W. Nakahara). The specimen was found in company with numerous examples of typical *B. astyanax.* Type in my collection.

As far as the wing markings are concerned, *arthemis* and *astyanax* can be connected up by two principal types of intermediate forms, namely, *proserpina* and *atlantis,* as follows:

*arthemis*: the white band, as well as the submarginal series of fulvous spots on upper side of hind wing complete;

*proserpina*: the white band partly obsolete; the fulvous spots present;

*atlantis*: the white band totally absent; the series of fulvous spots complete;

*astyanax*: the white band as well as the fulvous spots absent.

**Basilarchis misippus** ab. **cayuga,** nov. aberr.

The narrow postdiscal black belt of hindwing, upper side, closely preceded by a more or less broken series of white crescents. The white crescents larger on underside and form an interrupted belt, which is as wide as the black one. The oblique black belt of fore wing, upper side, extends down across the second interspace to join the black hind margin, instead of stopping short and running into the outer border at the third interspace. Otherwise same as the typical *misippus.*

Length of body, 4/5 inch; expanse of wings, 2¾ inches.

*Holotype*: ♀, Ithaca, New York, August 6, 1922 (W. Nakahara). Paratopotype: ♀, August 10, 1922. Types in my collection.

---

**Dr. Edwin C. Van Dyke in China.**

During the year 1923 Dr. Edwin C. Van Dyke's address will be, College of Agriculture, Nanking, China, where he will carry on some of the work already started by Prof. Woodworth. He expects to do some traveling as well in North China and Japan.

# Pontedera's 1718 Paper on the Cicada (Homop.).

Introduction by HARRY B. WEISS and Translation by WILLIAM HAMILTON KIRK, Ph.D., New Brunswick, New Jersey.

## INTRODUCTION.

While engaged in writing a biographical sketch of the life of Professor Benedict Jaeger, one of New Jersey's early entomologists, Mr. W. T. Davis, called my attention to a statement made by Jaeger in his book *The Life of North American Insects* (p. 101, ed, 1854) on the authority of Pontedera, that some cicadas live two years in the immature condition. Jaeger applied this to our species and this statement, more or less modified but substantially the same, has appeared in American text books on entomology issued as recently as 1921. Mr. Davis says that as far as he is aware the only cicada life cycle which is known is that of the 17-year one.

In an effort to trace Jaeger's statement to its source reference was had to Pontedera's writings and the only cicada paper which could be located was found to be incorporated in Pontedera's "Compendium of Botanical Tables etc.," as a part of a letter to G. Sherard, occupying some seventeen pages at the end of the book. Through the kindness of Dr. John Barnhart of the New York Botanical Garden, photographs were taken of these pages and from the photographs the translation of the original Latin has been made.

According to the biographical dictionaries consulted (Rose's Biographical Dictionary vol. XI, p. 192, London 1853; Biographie Générale, Didot Fréres, vol. 4, p. 781) Pontedera, a learned botanist and antiquarian, was born at Vicenza, May 7th, 1688, and died September 3, 1757. He studied medicine and anatomy under the celebrated Morgagni at Padua where he afterward succeeded Viali in the botanical chair at the University of Padua. It is also stated that he neglected the practice of medicine and applied himself to the study of botany. According to Sachs' "History of Botany," Pontedera rejected the idea of sexuality in plants and thought that the nectar produced by the flowers was absorbed by the seeds that they might be longer preserved. He regarded the male flower in dioecious plants as a useless appendage.

In the translation which follows nothing definite can be found concerning the length of time which the cicada spends in the ground. However, as will be noted, Pontedera makes the following statement,—"for neither in the year in which it is born does it turn out a tettigometra, nor in that in which it exists as a tettigometra does it become a Cicada," and this may have been interpreted by Jaeger as indicating a subterranean period of two years regardless of the vague manner in which Pontedera wrote. However in spite of the fact that the origin of the "two year statement" is not to be definitely found in Pontedera's writings, it was thought desirable to present the translation of this hitherto inaccessible cicada paper in view of Pontedera's other statements and so that it would be available to American students.

TRANSLATION.

[The complete title of the book is "A Compendium of Botanical Tables by Giulio Pontedera, Philosopher and Physician, in which are enumerated two hundred and seventy-two Plants lately discovered by him in Italy. With a letter of the author to the distinguished William Sherard, Englishman, the foremost of the Botanists of our age, discussing these Tables and others to be published at another time. Padua. 1718," and the translation of the part of the Sherard letter dealing with the cicada follows:]

I have expounded to you briefly my opinion also regarding the second Tables, to which I will add as a conclusion a little work, which I have in hand, on the Cicada, in imitation of Fabius Columna, a most eminent man, who added accounts of some animals to his Plants. Furthermore, this little animal, than which we find none more celebrated and illustrious in the writings of ancient and modern Physicists, still lies, in this light of Philosophy, wrapped in much darkness. For although by fine discoveries the later age has shaken many opinions which the ancients arrived at concerning other animals, in the case of the Cicada there has not only been no progress, but even statements that were not altogether improbable have been made more obscure and uncertain. The cause of this, if you want

to know, was the Cicada itself; first the fact that they never caught it in the act of hollowing out its nest and depositing eggs; for as soon as anyone approaches it flies away before it can be seen; then in dissecting it not only is there great difficulty, but a previous knowledge of its nature is required; for my part I did not hit upon the real use of its parts, although I had dissected innumerable specimens, until I had studied the habits of the Cicadae in the fields. Besides most people are averse to this laborious method of study; not knowing that only those can grasp the nature of the Cicada who have followed it assiduously while it, as Hesiod says,

"All day from early morning on pours forth its song
In the fiercest heat, when Sirius parches the skin."

But all this was made easy to me by my investigation of Plants. Wherefore I intend to undertake a complete history of the Cicada; for the present, since I have found that you take pleasure in matters of this kind, I will let you have this brief description.

And first I will divide the Cicadae into two genera as Aristotle did, History of Animals, Book V, ch. XXV; "Of cicadae (tettiges) there are two genera; the small which appear first and die last; and the large, those that sing, which are born later and die earlier;" whom Ulysses Aldrovandus followed in his fifth book, entitled "On Insects." I too knowing no others, will divide them into greater and less; and first I will notice the greater, which the Philosopher calls *achetae;* then I will speak of the smaller, called *tettigoniae;* and will use these names. Of the greater there are two forms namely male and female; of the lesser, the same number. In both genera only the males chirp, the females being mute; since they are destitute of musical organs. But what Aristotle said of the male *tettigoniae* "those which have the division sing somewhat," I have found not to be true; for these *tettigoniae* sing just as much and are *achetae* except for the difference in size. But what the organs are, with which the Cicadae make their noise, has not been made clear by our authorities. Some assert that the song of the Cicadae is made by the motion of their wing, the air struck by this communicating to our senses the vibrations and tremors;

one saying "From its wings it pours a clear song;" another, "the Cicada sending forth its song by rubbing itself under the wings." This is the general opinion, people being deceived by the likeness to the Grylli and to some Locusts. I have heard others affirm that the Cicadae make the sound ti-ti by the lowest part of the belly approching the breast and retreating from it with varying rapidity. But all those who have studied the formation of the Cicadae with more care refer these trillings to the membrane which the males in both classes possess. Aristotle, from whom others have borrowed, says in Hist. Anim. Bk. IV. ch. VII: "Those which are called *achetae* are divided at the waist and have a visible membrane; but the *tettigonia* have not;" and in ch. IX: "Some (insects) are said to sing, as the Cicadae: all which make the sound by means of the membrane, which is stretched at the incision of the waist, as the Cicada, by the friction of the respiration." And in Bk. V. ch. XXV, "those which sing, whether they are of the class of the larger or of the smaller, have an incision at the waist; but those in which that part is unbroken do not sing." This is about all that Aristotle has written about this organ; from which I will show that he was ignorant of the true instrument of the sound; first because he affirms that there is one membrane; for in each Cicada there are two, one on each side; then because he calls this "apparent" and (in Scaliger's interpretation) "such that it can be seen." Which is not at all the case; for in the *achetae* (of whom he is chiefly thinking, since he hardly admits the *tettigoniae* among the singing Cicadae, as I have indicated above) these membranes are covered with scales and are not visible unless you remove the scales; only in the *tettigoniae* are they uncovered. Finally as to the fact that he places this membrane under the part between the thorax and abdomen and allows it to other insects, for I have always found it, or rather them, in the thorax and only in the Cicadae. But what Aristotle understands by this membrane, I will show by representations; meanwhile I will put here for your benefit, the description of Ulysses Aldrovandus. "For" (says he, in Bk. II On Insects, ch. XIII, On the Cicada) "I have found from a careful inspection of both sexes that all the males have a mem-

brane outside" (note outside) "in the neighborhood of the waist, split in the middle; the form of which corresponds to the fruit of *Thlaspus parvus Hieracifolius* depicted by Lobelius; and that the females lack this membrane; this is known to the peasants, who also all affirm that the Cicadae lacking such a membrane are silent; but that those which have it sing." John Jonston, Bk. I, ch. V, On Insects, repeats this but more plainly: "This" he says "is to be ascribed to the reverberation of the membrane under the *flabellae* (so they call the coverings adhering to the belly behind the hindmost legs)." But this membrane of which they speak has nothing to do with the chirping; for, when it is pierced, the Cicada still chirps: but when those I mean are lacerated it becomes mute. This is the opinion as to the song of the Cicadae, shared by all others, whether Philosophers or Poets as Aelian, de Animalibus Bk. I; "the Cicadae are most talkative at the waist." He is followed by Phile in his Book on the properties of Animals who says, "The bridge (constriction) of the waist makes the males of the race of Cicadae song-loving." Also Joachim Camerarius (to name one of our learned men also) in the book, which begins *"on Cicadae,"* speaks thus: "A thin membrane is the organ of song." I shall take care to have these membranes carefully delineated in the Tables, and shall call them drums, not only from a certain resemblance of the parts, but also from the not different use: for as the spirits of soldiers are fired to fight more boldly by those warlike instruments, so the Cicadae, when "The places are excited and swell with seed, and the inclination arises to emit the seed towards that to which the fell desire all tends" (Lucretius, IV, 1045, 1046), conceive greater madness from these concussions, and rage more greedily for sexual intercourse. And the females, which lack these organs, are solicited by the song of the males to come to intercourse with no less alacrity, and are also carried away by the internal madness, by which the genital parts are stimulated. For I think that this organ was created in the Cicadae for no other purpose, than that there might be a fixed signal for their coming together for the act of generation. In other animals nature, which is intent chiefly on this end, has placed something

not dissimilar. The males of the Grylli and of some Locusts invite the females by making a noise with their wings, the Bombyces also enter into intercourse with a clapping of their wings: but more remarkable is what I noticed not long ago in the Cicindelae. They are brought together not by song or rubbing of the wings, but by the vibration of light. It was by mere chance that I observed this; for when I was collecting the females at night, and, placing them in the hollow of my hand, was inspecting their bright part, a male attracted by their light flew up, and gave the desired embraces (Virgil, Aeneid, VIII, 405), and when he was removed, others came. In short, it often happened to me to have this experience. And there is a reason for it; for since the females lack wings and therefore belong to the earth, and the males are winged and wander through the air, they would not be so easily called to intercourse, if a signal were not given on both sides. Wherefore a light was invented by the wonderful artificery of nature, than which nothing could be perceived at a greater distance or more clearly by the little animals of the night. Perhaps the same nature belongs to the Indian Cucujus, which can in a way be put in the class of the Cicindelae; for weighty authors testify that it glows at night. But I see that natural historians are not agreed as to why the Cucuji come to the torch, when it is displayed. Peter Martyr has this to say about the nature of the Cucujus: "A man who wants Cucuji goes out at twilight, in his hands he carries a lighted brand, he ascends a near height, from which he can be seen by the Cucuji; calling the Cucujus in loud tones, he whirls the brand around, crying 'Cucujus, Cucujus.' Some simple people think that the Cucuji fly up delighted at his shouting, for they come in haste," etc. I suspect that they come to the light in the way in which the Cicindelae are called to the Cicindelae. And let this have been said by the way concerning the uses, which I think the song of the Cicadae serves, and I could show something not dissimilar in birds, in animals, which are called perfect, and also in snakes, which for the same reason nature has implanted in all these, but enough of this.

(To be continued)

# Undescribed Species of Eriocera and Penthoptera from Tropical America (Tipulidae, Diptera).

By CHARLES P. ALEXANDER, Amherst, Massachusetts.

The new species described in this paper were collected by E. B. and J. H. Williamson and W. H. Ditzler, in Venezuela, and by J. H. Williamson in Peru. Through the kindness of the collectors, the author has been permitted to retain the types in his collection.

**Eriocera longipennis** sp. n.

Antennae short in both sexes; general coloration reddish fulvous; wings long and narrow, brown; stigma very small; abdomen and legs dark brown.

♂.—Length 9.5 mm.; wing 15.5 mm. Rostrum brown, the palpi dark brown. Antennae short, dark brown. Head fulvous, the anterior part of the vertex more suffused with brown.

Mesonotum reddish fulvous, the praescutum with a narrow and indistinct brown line. Pleura brownish fulvous, the dorso-pleural membrane dark brown. Halteres dark brown, the base of the stem paler. Legs with the coxae and trochanters testaceous; remainder of the legs black, the bases of the femora paler. Wings long and narrow, strongly tinged with brown; stigma very small, faintly indicated, dark brown; veins dark brown. Venation: *Sc* extending a short distance beyond the fork of *Rs*, *Sc2* about opposite the fork of *Rs; Rs* very long, much longer than *R4+5*; basal deflection of the latter very short; cell *M1* lacking; veins issuing from cell *1st M2* long and slender; basal deflection of *Cu1* just beyond the fork of *M; Cu2* a little shorter than the basal deflection of *Cu1*; cell *2nd A* very narrow; anal angle lacking.

Abdomen dark brown, the hypopygium a little brighter.

*Habitat.*—Venezuela. *Holotype,* ♂, Macuto, January 29, 1920 (Williamson).

It is possible that *Eriocera longipennis* may more properly be considered a species of *Penthoptera.*

**Eriocera dimidiata** sp. n.

Antennae short in both sexes; general coloration black, the mesonotal scutellum and postnotum reddish; pleura reddish, marked with black; wings with a strong brownish suffusion.

♂.—Length 10 mm.; wing 13 mm. ♀.—Length 12 mm.; wing 11.6 mm.

Rostrum and palpi dark brown. Antennae short in both sexes, black. Head brownish black, the occiput more brownish; vertical tubercle very conspicuous, each lateral angle produced into a conical knob.

Mesonotal praescutum and scutum black, the scutellum and postnotum abruptly reddish. Pleura reddish, the dorso-pleural membrane and a spot on the mesepisternum dark brown. Halteres dark brown. Legs entirely black, including the coxae. Wings with a strong brown suffusion, darkest in the costal and subcostal cells; basal and anal cells slightly paler medially; veins dark brown. Venation: Cell *M*1 lacking; cell 1*st M2* irregularly pentagonal; basal deflection of *Cu*1 beyond the fork of *M*, longer than *Cu*2.

Abdomen black.

*Habitat.*—Venezuela. *Holotype*, ♂, Tachira, Tachira, April 8, 1920 (J. H. and E. B. Williamson and W. H. Ditzler). *Allotopotype*, ♀, April 11, 1920. *Paratopotype*, ♂, April 4, 1920.

The paratype is in the collection of the University of Michigan.

**Eriocera perenensis** sp. n.

General coloration yellow; mesonotal praescutum with four conspicuous dark brown stripes; a conspicuous basal pit on mesonotal postnotum; wings faintly tinged with brown, the stigma only faintly darker; abdomen with a broad black subterminal ring.

♂.—Length 15 mm.; wing 13.3 mm. Rostrum brown; palpi black. Antennae short; scape obscure yellow; remainder of antennae brownish black, the base of the first flagellar segment pale. Head obscure yellow; vertical tubercle inconspicuous, dorsally with two rows of black setae; a small shiny cicatrice on antero-lateral portion of tubercle.

Pronotum brown, blackened laterally. Mesonotal praescutum with four conspicuous, dark brown stripes, the median pair but narrowly separated; scutum yellow, the lobes largely dark brown; scutellum testaceous medially, dark laterally; postnotum obscure yellow, darker posteriorly; on either side between the median and lateral sclerites at base a large, conspicuous, circular pit. Pleura yellow, the dorso-pleural region narrowly dark brown. Halteres dark brown, the base of the stem conspicuously yellow. Legs with the coxae pale, the base narrowly and indistinctly darkened; trochanters obscure yellow; femora brownish yellow, the bases clearer, the apices darker brown; tibiae and tarsi dark brown.

Wings faintly tinged with brown; stigma and broad seams along the longitudinal veins indistinctly darker; veins dark brown. Venation: *Sc2* close to tip of *Sc*1, the latter a little the longer; *r* on *R2* less than its length beyond the fork and on *R*1 about three to four times its length from the tip, *R*1 being bent strongly caudad at *r;* deflection of *R*4+5 subequal to *r-m;* cell 1*st M2* a little narrowed distally, *m* less than one-half the outer deflection of *M*3; cell *M*1 lacking; basal deflection of *Cu*1 just beyond the fork of *M, Cu*2 and the deflection of *Cu*1 subequal.

Abdomen with the first tergite brown basally; remainder of the abdomen yellow except a broad black subterminal ring which includes all of segments six and seven, and all of five except the narrow base.

*Habitat.*—Peru. *Holotype,* ♂, Colonia del Perené, Campamiento, June 5, 1920 (J. H. Williamson).

*Eriocera perenensis* is related to *E. cornigera* Alexander, differing in the lack of slender curved horns on the vertical tubercle and the details of coloration.

**Eriocera williamsoni** sp. n.

General coloration dark brown, the ventral sclerites of the thorax and abdomen yellow; legs black; wings with a pale brown tinge, the stigma and indistinct seams along the cord pale brown; *Sc* comparatively short, *Sc1* ending just beyond the fork of *Rs;* cell *M1* lacking: cell *1st M2* very long and narrow.

♂.—Length 9.8 mm.; wing 9.7 mm. Rostrum and palpi brownish black. Antennae with the first scapal segment brownish black; second segment brown; flagellum broken. Head blackish, gray pruinose; vertical tubercle inconspicuous.

Mesonotum dark velvety brown, the praescutal stripes a trifle paler than the ground-color, the broad median stripe split by a capillary dark line. Dorsal pleurites dark brown, including the lateral sclerite of the postnotum; ventral pleurites and sternites yellow. Halteres relatively long and slender, the base broadly dark brown, the distal half of the stem paler brown; knobs dark brown. Legs with the coxae and trochanters obscure brownish yellow; remainder of the legs black, the femoral bases very little paler.

Wings with a pale brown tinge, more suffused in cells *C* and *Sc* and at the wing-tip; stigma and indistinct seams along the cord and outer end of cell *1st M2* slightly darker brown. Venation: *Rs* only a little longer than *R; Sc* comparatively short, *Sc1* ending just beyond the fork of *Rs*, *Sc2* a short distance before the fork; *r* on *R2* about one and one-half times its length beyond the fork and on *R1* about two and one-half times its length from the tip: *R2* more than twice *R2+3*; deflection of *R4+5* shorter than *r-m;* cell *1st M2* very long and narrow, rectangular, longer than any of the veins beyond it: cell *M1* lacking; basal deflection of *Cu1* at about two-fifths its length beyond the fork of *M*, longer than *Cu2* alone.

Abdominal tergites dark brownish black, the base of tergite two paler; sternites obscure brownish yellow.

*Habitat.*—Peru. *Holotype,* ♂, Colonia del Perené, Campamiento, June 6, 1920 (J. H. Williamson).

This interesting species is named in honor of the collector, Mr. Jesse H. Williamson, to whom I am indebted for several

interesting Neotropical Tipulidae. The fly much resembles a *Penthoptera* and it is probable that the two genera will need to be united, a course already followed by Mr. Edwards.

**Penthoptera candidipes** sp. n.

Mesonotum reddish brown, unmarked; pleura yellow with a broad brownish, dorsal, longitudinal stripe; legs brown, the tarsi white; on the posterior legs, the metatarsi entirely white; wings with a yellowish tinge: distal section of *R*1 about three times *r*; *r-m* connecting with *Rs* at its tip, obliterating the basal deflection of *R*4+5.

♀.—Length 10.5 mm.; wing 10.3 mm. Rostrum and palpi brown. Antennal scape yellow, flagellum dark brown. Head dark brown, sparsely gray pruinose.

Mesonotal praescutum reddish brown, without stripes, the extreme lateral margin narrowly yellowish; remainder of the mesonotum reddish brown, the postnotum more plumbeous. Pleura yellowish, the dorsal sclerites with a broad brownish longitudinal stripe. Halteres dark brown. Legs with the coxae and trochanters obscure yellow; remainder of the legs dark brown, the femoral bases indistinctly paler; terminal tarsal segments snowy white, on the fore and middle legs the white includes a little more than the distal half of the metatarsi; on the hind legs the metatarsi are entirely white: fore metatarsi much longer than the posterior metatarsi; fore metatarsi about three and one-half times the remaining tarsal segments; posterior metatarsi less than twice the remaining tarsal segments; inner apical angles of the tarsal segments slightly produced and armed with bristles, those of the metatarsi stronger than the others.

Wings with a yellowish tinge; stigma lacking; wing-tip indistinctly darkened; veins dark brown. Venation: *Sc*1 ending about opposite one-third the length of *R*2+3, *Sc*2 some distance from the tip of *Sc*1, the latter alone being longer than *r-m*; *Rs* long, strongly arcuated at origin; *r* on *R*2 a little more than its length beyond the fork of *R*2+3; distal section of *R*1 about three times *r*; deflection of *R*4+5 lacking, *r-m* connecting directly with the end of *Rs*; cell 1*st M*2 elongate-rectangular, a little shorter than vein *M*1+2 beyond it; cell *M*1 lacking; basal deflection of *Cu*1 a little more than one-half its length beyond the fork of *M*.

Abdominal tergites dark brown; sternites obscure yellow. Ovipositor with the basal shield obscure yellow; tergal valves reddish horn color, acicular.

*Habitat.*—Venezuela. *Holotype,* ♀, Tachira, Tachira, April 9, 1920 (J. H. and E. B. Williamson and W. H. Ditzler).

The only close ally of the present species is *Penthoptera batesi* Alexander of the Upper Amazons. The present species is readily told by the diagnostic characters as given above.

# Hemipterological Notices.—III. (Miridae, Lygaeidae.)[1]

By H. M. PARSHLEY, Northampton, Massachusetts.

**Dicyphus gracilentus** sp. nov.

General coloration pale yellow, marked with brown and black, polished. Head black, marked at base with a yellow area slightly wider than distance between eyes and extending from the postocular transverse impression posteriorly beneath pronotal collar. Pronotum yellow, with large pleural black areas barely visible from above; translucent, the inferior dark coloration showing through to some extent; scutellum black, opaque, with two very small triangular yellow spots at basal angles of apical lobe. Hemelytra pale yellowish, nearly opaque, marked with reddish brown; clavus reddish brown with pale streaks along vein and on basal half of commissure, and a faint pale dot at apex; corium with vague reddish areas inwardly on disc and two dark brown spots at apex; cuneus pale yellow, with a brown spot at apex; membrane largely brown, paler at sides. Antennae black, the basal segment variably paler except toward apex. Rostrum pale yellow, dark at apex. Legs pale yellow, the femora inconspicuously dotted, the tarsi black apically. Ventral surface polished; thorax black except prosternum and area of scent gland; abdomen yellow, with variable dark markings often confined to genital segments.

Head slightly wider than long (30-25), the vertex prominently swollen anteriorly, the eyes decidedly prominent and large; viewed from above the distance between eyes is about equal to the width of one eye, and length of eye much greater than width (15-10); sides of head behind eyes moderately convergent, the postocular distance much less than distance between eyes. Antennae about twice as long as head, pronotum, and scutellum together; first segment twice as long as distance between eyes; proportions of segments: 1st, 20; 2nd, 56; 3rd, 46; 4th, 20. Rostrum extending between posterior coxae, the first segment somewhat beyond posterior margin of eyes. Pronotum twice as broad at base as long on median line; apical stricture and transverse depression very deep and distinct, strongly curved, concentric; the anterior lobe strongly convex; posterior lobe shorter than anterior with collar (5-7), very obsoletely and sparsely punctate. Scutellum about as broad as long, not carinate, the anterior lobe shorter than the posterior (12-17). Hemelytra very obsoletely punctate, a little more than three times as long as wide (85-27), slightly broadened at middle in both sexes; apex of cuneus extending well beyond apex of abdomen in both sexes. Head, pronotum, and scutellum with a few sparse setae; hemelytra with very fine and sparse pale pubescence; femora and tibiae minutely spinulose. Apical segments of male abdomen slightly enlarged, the claspers very small.

Length 4.5-5 mm.

[1]Contributions from the Department of Zoology, Smith College, No. 90.

*Holotype* ♂ and *allotype*: Urbana, Illinois, 14 July, 1922 (P. A. Glick) in my collection. *Paratypes* ♂ ♀: numerous specimens with same data, and, from the same locality: 8 July, 1887 (C. A. Hart); 2 July, 26 September, 1921 (A. O. Weese) in collections of H. H. Knight, P. A. Glick, A. O. Weese, etc.

This species seems most closely related to *D. famelicus* Uhler, from which it is readily distinguished by coloration, less exserted head, slightly broader form, etc. In *agilis* Uhler the pronotal groove is scarcely developed and the first antennal segment is shorter. Mr. Glick, who intends to figure the insect in his forthcoming work on insects affecting weeds, found it in great abundance on *Polymnia canadensis* Linn., the leafcup. Dr. H. H. Knight independently established the novelty of this form from the Hart material mentioned above among the paratypes.

I take this opportunity of recording the second locality for *Dicyphus notatus*, which I recently described from South Dakota; Knight has sent me two specimens collected by C. A. Hart, labeled respectively, Fountain Bluff, Illinois, 8 July, 1887 and Urbana, Illinois, 18 March, 1888.

## New Records of Lygaeidae.

**Orthaea fracticollis** Schilling. Montreal, Quebec. 16 May, 1915 (J. I. Beaulne).

**Orthaea lurida** Hahn. Montreal, Quebec, 17 May, 1915 (J. I. Beaulne).

These European species, now recorded for the first time from North America, are described and figured (under the genus *Plociomerus*, later corrected to *Pamera*) in Saunders' "Hemiptera Heteroptera of the British Islands." My friend H. G. Barber was the first to detect *fracticollis*, and he has confirmed my determination of *lurida*. The following key will aid in distinguishing these species from one another and from their only congener found in the northeastern states.

1. Pronotum moderately constricted slightly behind middle, the sides of the anterior lobe but slightly curved, convergent: length 4.7-5 mm.............................. *Orthaea fracticollis* Schilling.
- Pronotum strongly and sharply constricted well behind middle, the sides of the anterior lobe strongly curved...................... *2*

2. Anterior lobe of pronotum transverse, widest at middle, with fine erect pubescence; scutellum black or brown; pale markings of dorsal surface indistinct; length 4.5 mm...... *Orthaea lurida* Hahn.
   Anterior lobe of pronotum more elongate, widest behind middle, with sparse decumbent pubescence; scutellum bicolored; pale markings very distinct; length 4-4.5 mm............. *Orthaea basalis* Dallas.

# Immunity to Parasitism in Samia cecropia Linn. (Lep.: Saturniidae; Dip.: Tachinidae.)

By L. S. West, Instructor in Parasitology, Dept. of Entomology, Cornell University, Ithaca, New York.

The possession of immunity on the part of certain hosts to parasitic invasion is a recognized fact, but our knowledge of this whole subject is so meagre, that any illustration of the phenomenon is worthy of note. The following striking example in our common Cecropia moth, came under the observation of the writer, who is conducting investigations on the life-habits of "Tachinidae" (Diptera), and who has in progress a systematic revision of this group of parasitic flies, as occurring in the State of New York.

On August 1, 1921, there was brought into this laboratory by a student, a fully grown Cecropia larva, bearing along its back and sides thirty-five or forty white, "macrotype" Tachinid eggs. Examination revealed the fact that the eggs had already hatched, and a tiny puncture in the integument of the host near each egg indicated the point where the little maggot had gained entrance. The caterpillar was accordingly confined in a suitable rearing cage and kept supplied with food until August 5, 1921, when pupation took place. It was of course supposed that a rearing record would be secured, and the cage and contents were placed outdoors and kept under observation during the winter.*

On June 25, 1922, no parasites had emerged and it was considered probable that severe weather conditions had destroyed them. On July 14 however, the writer was exceedingly astonished to find a normal female Cecropia, emerged from the cocoon. She was dead, but a considerable mass of eggs testified that she had lived long enough for oviposition. Dr. W. T. M.

*A few of the recorded parasites of Samia cecropia might be mentioned. Hymenoptera: Ophion macrurum Linn., Ophion bilineatus Say, Bracon flavator Fabr., Cryptus extrematis Cr., Cryptus nuncius Say, Diglochis omnivorus Walk., Spilochalcis mariae Riley, Theronia fulvescens Cr. Diptera: Frontina frenchii Will., and Winthemia quadripustulata Fabr. Both these flies are parasitic on a great variety of hosts.

Forbes, of this laboratory, specialist in Lepidoptera, examined the specimen and asserted that the moth had apparently laid a full complement of eggs and had died of old age. The eggs were shrunken in the manner characteristic of Cecropia eggs that have not been fertilized.

Careful dissection and examination of the cocoon revealed no evidences of parasitic invasion beyond the old hatched eggs, which were still to be seen, attached to the remains of the last larval skin. The interim of five days between observation of parasitism and the spinning of the cocoon would seem to exclude all possibility of the parasites being "molted" at the time of pupation, hence the possession of "complete immunity" in this case must perforce be acknowledged. But when we consider the tremendous power of resistance, necessary, on the part of the host, to destroy and absorb such a large number of parasites, and then to mature normally, as though nothing of a disturbing nature had taken place, the phenomenon acquires added significance.

The question first arises as to whether we have illustrated a case of "specific immunity" or, more remarkable still, of "individual immunity." That is to say, would another Cecropia moth have been able to resist this particular parasite in the same way, or was this particular individual immune, just as individuals among us are immune to the invasion of certain disease organisms? In the absence of conclusive evidence, and in consideration of the complete failure of the parasites to mature, we are forced to take the former view, as the more conservative, but the other possibility is worthy of consideration, and the accumulation of a certain amount of careful data, in connection with several rearing records, might go far toward clearing up this particular question.

Also, in touching upon the problems of immunity, we find ourselves confronting the old question, as to just how immunity reactions take place. Is the resistant action phagocytic or are there toxins produced which act as destructive agents? This is a problem affecting workers in fields far beyond the realm of Entomology, but the writer, who is keenly interested in this subject, is of the opinion that insect parasites and their hosts

furnish excellent material for the solution of this very problem. Some work of this type has already been done,* but the problem, as everyone knows, is an open one. Who can say but that one phase of Entomology may be thus brought to serve workers in other fields of scientific endeavor?

**Scarites subterraneus Fabr., an Interesting Malformation (Col.: Carabidae).**

There is in the New York State collection of insects a specimen of this beetle having two nearly equally developed and almost normal prothoracic segments, each with normal or nearly normal prothoracic legs. The anterior prothoracic segment is a little narrower, a little shorter, and inserted somewhat like the head usually is in the presumably normal segment. The mesothoracic legs are represented only by normal coxae and slightly modified trochanters, the remaining segments having disappeared. The specimen, therefore, has the normal six legs, though it is what might be characterized as an unusually "chesty" individual with its two pairs of prothoracic legs.—E. P. FELT, Albany, New York.

**Additions to the Collections of Insects at Iowa State College.**

Dear Doctor SKINNER: It may interest you to know that the best part of my collection of Mexican Lepidoptera is now at the State College, at Ames, Iowa, and is known as the "Dr. Skinner Collection." This is out of courtesy to you for the work done in identifying and naming most of the rarer specimens.

Enclosed you will also find a clipping from a local paper that will interest collectors. I have never seen this collection so do not know just what it is but presume it is good.—M. E. HOAG, Wapello, Iowa.

Ames, Nov. 3—A collection of 17,000 butterflies from all parts of the world has been added to the entomological collection at Iowa State College, according to an announcement made by Dr. C. J. Drake, head of that department.

This collection, which was made up by J. S. Faaborg, of Clinton, includes 8,000 different varieties of butterflies.

Mr. Faaborg began his collection of insects while he was a school teacher in Denmark, nearly fifty years ago, and has continued it along with his other business. In disposing of the collection to the college at small price, scarcely enough to pay for the cases containing the collection, he desired to place his life work where it would be of use to the public and receive good care. (*Nevada [Iowa] Evening Journal*, Nov. 3, 1922.)

*Thompson, W. R. The relation of Phagocytes to the parasites of Arthropoda. Thesis submitted to the faculty of the Graduate School, Cornell University, Ithaca, N. Y., for the degree of Master of Science in Agriculture. 1912. (Gives excellent bibliography.)

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JANUARY, 1923.


### "Kindness to Butterflies."

The following letter from C. W. Bigler, of Wayne, Mich., was published in *The Christian Science Monitor*:—

"It is a wonder to me why a free, life-loving people will allow the wholesale slaughter of butterflies. The Humane Society has endeavored to cultivate humaneness and as a result there is a greater amount of kindness shown toward animals.

"Because someone started the fad of putting butterflies in trays is no reason why we should follow this system of cruelty. If this practice continues, what will become of the beautiful experience that is ours every spring—the first appearing of the butterfly, a sign that spring is here with its manifestation of life, and activity. Let us have a 'drive' to put this fad out of business. Have it start today."—(*Our Dumb Animals*, 1922, 55, p. 93.)

There may be some reasons advanced for not putting butterflies into trays and jewelry, but that it is a "system of cruelty" is not true. There are a number of experiments that may be performed showing that insects do not suffer pain. We will refer to only one. If the end of the abdomen of one of the large dragonflies be turned to the mouth of the insect, it will eat the abdomen as far as it can reach, with apparently great enjoyment. Moreover, butterflies are collected in nets and then killed in cyanide bottles, which give off the fumes of hydrocyanic (prussic) acid which acts quickly. The butterflies that are used in trays are nearly all tropical species and we need hardly fear not seeing the butterflies appear here in the spring as usual.—HENRY SKINNER.

The NEWS will be glad to receive articles of general entomological interest, such as accounts of collecting trips, of the length of two to three of our printed pages.—*Editors.*

### Seitz: Macrolepidoptera of the World.

We are informed that the Palaearctic part of this work has long since been concluded and of the exotic part there have appeared 108 "hefts" on the American fauna, 117 on the Indian and 34 on the African. The publisher is Alfred Kernen, Poststrasse 7, Stuttgart.

# Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### The Proper Spelling of Ornithodoros talaje Guérin-Méneville (Acar.: Ixodoidea).

This tick species was described by the French author in the *Revue et Magasin de Zoologie,* Second Series, Volume I, 1849, pages 342-344, from specimens received from Sallé which he collected in Guatemala. In his description he quotes from Sallé's notes concerning the bite of the creature, and states that the local people call the biter *talaje.* Guêrin-Méneville very properly adopted this native name.

It seems, however, from information just received from Señor Sam. Marcias Valadez, of Mexico City, that Sallé should have spelled the name t-l-a-l-a-j-e, the word being of Aztec origin, *tlalli* meaning earth. Señor Valadez also states that Doctor Brumpt is mistaken in saying that in Colombia they call ticks *talajas.*

Of course, according to the rules of zoological nomenclature, Guérin-Méneville's name must stand as originally spelled, but Señor Valadez' statement is of interest.—L. O. Howard, Washington, D. C.

---

### Indian Massacres of Early Days Outdone! Wholesale Slaughter of Peaceful *Pawnees by Whites!

On Saturday, September 2nd, another chapter was added to the tale of atrocities growing out of the warfare between white settlers and the Indians. On that date two whites, R. A. and Paul H. Leussler, made a raid on the tribal stronghold of the Pawnees two miles south of Pilger, Nebraska.

The attack, which was entirely unprovoked, was so sudden and unexpected that the Pawnees were wholly unprepared and the slaughter was appalling. Thirty braves and twenty-three squaws were slain in the battle, which lasted about four hours.

From meager details obtainable at this writing, it appears that the white wretches left Omaha in the early hours of the morning and covered the hundred miles to Pilger in a motor car, stopped in the village for a hurried lunch and then hastened southward on the state highway. Two miles from town they encountered the Pawnees on the high, rolling prairie in a blazing, scorching sun, and the fight was on.

What makes this butchery all the more horrible is that most of the braves captured or slain were already mutilated, as were also some of the squaws.

When interviewed, the elder Leussler, who is said to have organized and led the raid, stated that he had suffered from hay fever for many years in his pursuit of the Pawnees and therefore when he finally met up with them he was determinied not to spare a single one.

The scalps are now drying on the spreading boards. They are *not* first class specimens but are from the approximate type locality and are

the real *pawnee*.* Dodge in his original description says they are on the wing from the first to the fifteenth of September. The condition of the specimens taken by me September 2nd indicates that the species is in its prime about August 25th.—R. A. LEUSSLER.

**Notes on Variation in 53 Specimens Pamphila pawnee Collected at Pilger, Nebraska, September 2, 1922 (Lep., Hesperidae).**

There appears a great deal of variation in the above specimens. In the males there is variation in the ground color of the upper side from yellow to reddish-yellow or tawny, and in markings from lightly marked to very heavy fuscous. The ground color of the under side of secondaries varies from pale ochreous to dull orange.

Of 30 males, 16 had pale spots on under side of secondaries, varying from very faint to quite distinct, while the remaining 14 had the underside of secondaries immaculate.

In nearly all the males the shaded area or patch under the stigma is pronounced and heavy, but in a few it is so light as to be almost wholly wanting.

In the females the upper side varies from light fulvous with white spots to dark fuscous with creamy white spots on primaries and fulvous spots on secondaries. The ground color of the under side of secondaries varies from pale golden yellow to a darker greenish yellow. Eighteen had pronounced spots on under side of secondaries, varying considerably in size and distinctness, 2 had faint, rather indistinct spots, and 3 were entirely without spots.—R. A. LEUSSLER, Omaha, Nebraska.

**Ceuthophilus Infesting a Well (Orth.: Locustidae or Tettigoniidae)**

A correspondent of the Federal Bureau of Entomology writing from Denver, Colorado, records the occurrence in a well of large numbers of a species of the orthopterous genus *Ceuthophilus*. This well, which is situated near Palmer Lake, Colorado, at the base of the mountains, is about eighty feet in depth, was dug some twenty-five years ago and is walled with brick. It is in use for a month or so in the summer and at irregular intervals during the rest of the year. Access to the well was probably through cracks in the curbing, though it is possible that the insects got in through crevices beneath the surface of the ground, as the well is situated in a rocky location near a ravine. The insects appear to prefer life near the top of the well, provided the cover remains closed. The correspondent writes that when one opens the well for the first time, after a considerable absence from the premises, some twenty-five or thirty of the insects will be seen, mostly on the cement of the well-curb. At such times one or two dead specimens are apt to be found in each bucket of water drawn, often partially decomposed and therefore a potent source of contamination. But when in constant use the water is generally free from the insects.—A. N. CAUDELL, Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C.

**Pamphila pawnee* Dodge.

**Symphoromyia hirta Johnson Annoying in Colorado (Dipt.; Leptidae)**

When recently (July) collecting Eocene fossil insects and plants on the top of the Roan Mountains, Colorado, immediately south of the upper part of Roan Creek, I was persistently attacked by *S. hirta*, inflicting painful bites throughout the day in sunny weather, and occurring in prodigious numbers. The flies usually settled on the hands, but often on the back of the neck, and sometimes on the face. They are not easily frightened away, and can usually be captured by the fingers. I must have destroyed hundreds in this way, pinching or slapping them and throwing them down. They seem equally common near streams and on the dry sage brush (*Artemisia tridentata*) mesas, but they are absent from the valleys between the mountains.

I am able to confirm my determination by comparison with a specimen I collected on Twin Sisters Mountain, Colorado, in the Canadian zone, July 23, kindly identified by Dr. J. M. Aldrich. (*S. atripes* Bigot was also taken on Twin Sisters at the same time). In the key given by Aldrich (Proc. U. S. Nat. Mus., 49, p. 118) my specimens run out, because the tibiae are dark brown, not at all yellow. In the descriptive account, p. 125, it is stated that the tibiae may be dark, and in Johnson's original description we read "tibiae dark brown." The proboscis of the female in the Colorado specimens is clear ferruginous, not dark brown as given by Johnson. *S. hirta* was described from Pennsylvania. Possibly the Rocky Mtn. form may prove separable when better known, in which case it will take the name *flavipalpis* Adams.

Although the bites were painful at the moment, they seemed to produce no lasting effect.—T. D. A. Cockerell, Boulder, Colorado.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **16**—The Lepidopterist, Salem, Mass. **19**—Bulletin of the Brooklyn Entomological

Society. **23**—Bollettino del Laboratoria di Zoologia Generale e Agraria, Portici, Italy. **31**—Proceedings of the Acadian Entomological Society, Truro, N. S. **39**—The Florida Entomologist, Gainesville, Florida. **68**--Science, Garrison on the Hudson, N. Y. **85**—The Journal of Experimental Zoology, Philadelphia. **87**—Arkiv for Zoologi, K. Svenska Vetenskapsakademien, Stockholm. **91**—The Scientific Monthly, Lancaster, Pa. **102**—Broteria, Revista Lusco Brazileira. Serie Zoologica, Braga. **106**—Anales de la Sociedad Cientifica Argentina, Buenos Aires. **114**—Entomologische Rundschau, Stuttgart. **124**—Bulletin de la Societe Entomologique d'Egypte, Cairo. **144**—Proceedings of the Pacific Coast Entomological Society, San Francisco.

**GENERAL. Crampton, G. C.**—Notes on the relationships indicated by the venation of the wings of insects. **4**, liv, 206-16 (cont.). **Crutchley, G. W.**—Henri Fabre and the microgaster. **9**, 1922, 245-6. **Cuscianna, N.**—Osservazioni sull 'attrazione esercitata dagli odori sugli insetti. **23**, xv, 226-53. **Hoffmann, A.**—Nachtrage und richtigstellungen zu Entomologen adressbuch. **124**, ii, 115-17; 126-8 (cont.). **Janse, A. J. T.**—How to collect, preserve and study insects in S. Africa. (So. Africa Jour. N. H., ii, 230-40.) **Littlewood, F.**—Killing with cyanide. **9**, 1922, 260. **Rich, S. G.**—The collection of aquatic insect larvae. (So. African Jour. N. H., ii, 72-5.) **Seitz, A.**—Das aufsuchen der sammelplatze. **114**, xxxix, 43-4. **de la Torre Bueno, J. R.**—The inalienable right of authors to say what they please. **19**, xvii, 124-5. **Walton, W. R.**—The entomology of English poetry. **10**, xxiv, 159-203. **Weiss, H. B.**—The evening primrose in relation to insects. **4**, liv, 193-5. **Weiss & West.**—Notes on fungous insects. **4**, liv, 198-9. **Wellhouse, W. H.**—The insect fauna of the genus Crataegus. (Cornell Univ. Agr. Exp. Sta., Mem. 56.) **Wheat, S. C.**—Obituary notice of Silas C. Wheat. **19**, xvii, 125. **Willis, J. C.**—Age and area: a study in geographical distribution and origin of species. (Cambridge University Press. 1922. 259 pp.)

**NOTE.** We note that the Nova Scotia Entomological Society has changed its name to "The Acadian Entomological Society, and has thus broadened out its scope to include members from the three Maritime Provinces."

**ANATOMY, PHYSIOLOGY, etc. Bowen, R. H.**—Studies on insect spermatogensis. (Proc. Am. Ac. A. & Sc., lvii, 391-422.) **Kopec, S.**—Mutual relationship in the development of the brain and eyes of Lepidoptera. Physiological self-differential of the wing-germs grafted on caterpillars of the opposite sex. **85**, xxxvi, 459-65; 469-75. **Martini, E.**—Bemerkungen zu Feuerborns neuer theorie uber den thoraxbau der insekten. **52**, lv, 176-80. **Minnich, D. E.**—A quanti-

tative study of tarsal sensitivity to solutions of saccharose, in the red admiral butterfly. **85**, xxxvi, 445-57.

**THE SMALLER ORDERS OF INSECTA.** **Ferris, G. F.**—De Anopluris. **91**, xv, 551-6. **Longinos Navas, R. P.**—Algunos insectos del Museo entomologico de Berlin "Deutsches entomologisches museums." **102**, xx, 87-92. **Tillyard, R. J.**—The wing-venation of the Leptoperlidae. (Trans. R. Soc. So. Australia, **xlv**, **270**.)

**Davis, W. T.**—The dragonfly Epicordulia regina. **19**, xvii, 111-3. **Watson, J. R.**—Another camphor thrips. Additions to the Thysanoptera of Florida. **39**, vi, 6-7; 21-23.

**HEMIPTERA.** **Baker, A. C.**—Tingitidae or tingidae. **68**, lvi, 603. **Bergroth, E.**—New Neotropical Miridae. On the South American Miridae described by C. Stal. **87**, xiv, No. 21-22. **Brittain, W. H.**—Some factors influencing the occurrence of alate forms in certain Aphididae. **31**, 1921, 7-29. **Holland, W. J.**—Tingitidae or Tingidae again. 68, lvi, 535-6. **La Face, L.**—Osservazioni morfologiche e biologiche sull Antonina phragmitis. **23**, xv, 254-67. **Laing, F.**—Aleyrodidae: correction of generic nomenclature. **8**, 1922, 255. **Mason, A. C.**—Relation of environmental factors to wing development in aphids. **39**, vi, 25-32. **Milliken & Wadley.**—Geocoris pallens, decoratus, a predaceous enemy of the false chinch bug. **19**, xvii, 143-46. **Parshley, H. M.**—A note on the migration of certain waterstriders. **19**, xvii, 136-7. **de la Torre Bueno, J. R.**—Distributional records of aquatic Hemiptera. **19**, xvii, 120-1. **Vogel, R.**—Aus der naturgeschichte der singzikaden. (Aus der Natur, Leipzig, **xviii**, 264-7.)

**Olsen, C. E.**—A new species of Agallia, with notes on certain other Cicadellidae. **19**, xvii, 127-31. **Osborn, H.**—New sps. of Cicadellidae from the southern U. S. **39**, vi, 17-20. **Parshley, H. M.**—A change of name in Ischnodemus. **19**, xvii, 123.

**LEPIDOPTERA.** **Beutenmuller, W.**—Larva of Adelocephala bisecta. **16**, iii, 187-8. **Detwiler, J. D.**—The ventral prothoracic gland of the red-humped apple caterpillar (Schizura concinna). **4**, liv, 176-91. **Dukes, W. C.**—Isoparce cupressi. **19**, xvii, 110. **Kruger, E.**—Catoblepia orgetorix und verwandte arten in Columbien. **114**, **xxxix**, 42-3. **Seitz, A.**—The Macrolepidoptera of the World. Fauna americana. Parts 258-261. **Sturmhoefel, Dr.**—Zum hausbau der perophoriden. **114**, **xxxix**, 41-2.

**Barnes & Lindsey.**—Descriptions of two n. sps. of Aegeriidae. **19**, **xvii**, **122-3**. **Benjamin, F. H.**—A new form of Saturnid from Mississippi and Florida. Notes on N. J. Heterocera with descriptions of one new sps. and two new forms. **4**, liv, 192; 195-7. **Cassino, S. E.**—Some new Geometridae. **16**, iii, 183-7. **Cassino & Swett.**—Some

new Geometridae. **16,** 188-90. **Comstock, J. A.**—Studies in Pacific coast L. (Bul. So. Cal. Ac. Sc., xxi, 43-8.) **Dyar, H. G.**—New American moths. New forms of Cerura. **15,** x, 166-74. **Mayfield, T. D.**—Notes on the life histories of N. A. Catocalae, with description of two new forms. **19,** xvii, 114-20 (cont.)

**DIPTERA. Bequaert, J.**—Dolichopodidae from the source of the Hudson River. **19,** xvii, 149. **Brooke, G. E.**—Mosquito diagnosis: a suggestion to describe wing-spots, fork-cells and palp-markings by means of written formulae. **9,** 1922, 247-50. **Dyar, H. G.**—The species of Psorophora of the ciliata group. The American Aedes of the serratus group. **15,** x, 113-17; 157-66. **Enderlein, G.**—Ein neues Tabanidensystems. (Mitt. Zool. Mus., Berlin, x, 333-51.)

**Aldrich, J. M.**—A new genus of Helomyzidae. **19,** xvii, 108-9. **Curran, C. H.**—Notes and corrections (Syrphidae) **4,** liv, 191. **Felt, E. P.**—A new and remarkable fig midge. **39,** vi, 5-6. **Malloch, J. R.**—Notes on Clusiodidae. (Oc. Pap. Boston Soc. N. H., v, 47-50.) **Shannon, R. C.**—A revision of the Chilisini. (Syrphidae). **15,** x, 117-45.

**COLEOPTERA. Aurivillius, C.**—Neue oder wenig bekannte Coleoptera Longicornia. **87,** xiv, No. 18. **Benick, L.**—Ueber Boheman'sche typen der Staphylinidenunterfamilien Megalopsidiinae und Steninae nebst einer neubeschreibung. **87,** xiv, No. 14. **Casey, T. L.**—Studies in the rhynchophorous subfamily Barinae of the Brazilian fauna. (Mem. of the Coleoptera x, 1922, 520 pp.) **McColloch & Hayes.**—The Phyllophaga of Hawthorn. **19,** xvii, 131-35.

**Calder, E. E.**—Change of names in Cicindela. **4,** liv, 191. **Fall, H. C.**—New Coleoptera, X. **4,** liv, 170-73. New species of Coleoptera from Humbolt County, Cal. **144,** ii, 12-14. **Notman, H.**—New sps. of Carabidae, Staphylinidae, and Elateridae. **19,** xvii, 99-108.

**HYMENOPTERA. Baird, A. B.**—Some notes on the female reproductive organs in the Hymenoptera. **31,** 1921, 73-88. **Ford, N.**—An undescribed planidium of Perilampus from Conocephalus. **4,** liv, 199-204. **Grandi, G.**—Ricerche sul gen. Philotrypesis. **23,** xv, 33-190. **Kieffer, J. J.**—Trois nouveaux hymenopteres d'Argentine. **106,** xciv, 205-8.

**Bradley, J. C.**—The taxonomy of the Masarid wasps, including a monograph on the N. A. species. (Univ. Cal. Pub., Ent., i, 369-464.) **Cockerell, T. D. A.**—Descriptions and records of bees. **11,** x, 544-50. **McCracken & Egbert.**—California gall-making Cynipidae with descriptions of new sps. (Stanford Univ. Pub. Biol. Sc., iii, No. 1.) **Viereck, H. L.**—New bees of the genus Andrena. (Oc. Pap. Boston Soc. N. H., v, 35-45.)

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

VOL. XXXIV FEBRUARY, 1923 No. 2

CONTENTS



## The Wings of Bombyx mori (Lepid. : Bombycidae).

By C. W. Woodworth, Nanking, China.

The comparison of the wild species of mulberry silkworm, *Bombyx mandarina*, and its domesticated descendant, *Bombyx mori*, is of particular interest as showing the effect which selection and forcing (which have increased the size of the body till the wings are well nigh functionless) may have on the structure of the wing.

The size of the wing of the domesticated silkworm is larger than that of the wild form, but very much less proportionately than the size of the body. The difference in size of either body or wing between the largest and smallest domesticated race is greater than between the latter and the wild species.

The shape of the front wing of the wild species differs from the domesticated species in the much greater prolongation of the apical portion, making a very much more pronounced excavation in the margin just behind the tip. This, however, is a matter subject to much variation in the domesticated silkworm, the variation being decidedly greater than the difference between the nearest specimens of the two species. The hind wing of the domesticated species is larger in comparison with the front wing than in the wild species and it has lost some of the sharpness of the anal angle, but varies enough to render it impossible to sort the wings with certainty by this character.

In discussing the venation it will be convenient to name the non-terminal elements of the venation by the numerals used in the English system of notation, whereby the cell of the front wing will be bounded, beginning in the rear, by the vein segments bearing the numbers 2, 3, 4, 5, 6, 10, 11, and the stalks beginning near the tip 7, 8, 9. In the hind wing the cell boundary is 2, 3, 4, 5, 6. 8, 9, with the stalk numbered 7.

Segments numbered 2 and 3 of the front wing are more nearly equal and 4 is shorter in the wild species, but in both there is more variation than the difference between the species. so much so that it is probable that with a sufficient series the gap would be bridged. The domesticated species shows greater variation in this particular than the wild species. Numbers 4, 5, 6 are subequal in some specimens of both the wild and domesticated species, but with 4 always the smallest and 6 always the largest. In some wild forms 4 is decidedly the shortest. The greater variation seems to be in the wild species in this respect. Number 10 reduces almost to zero in some specimens of the wild species. It is always the smallest element in the venation of the front wing, but may be larger even in the wild species than shown in Comstock's figure* of the venation of *Bombyx mori.* This segment averages longer in the domesticated species than in the wild form. The stalks 7, 8, 9 may be subequal in both the wild and domesticated species and any may be longer when thus about equal. When

*Manual, p. 202, Wings of Insects, p. 332.

one is decidedly longer than the others then it is number 7 in the wild species and number 9 in the tame species.

In the hind wing the only differences noticed are the shortness of 4 in the wild species, which often reduces to zero, and the shortness of 7 in the domesticated forms, which may become equal or shorter than 6 though not commonly as short as shown in Comstock's figure. In the wild form it is at least as long and may be nearly or quite twice as long.

The tracheation of the veins can be quite readily followed if the wing is sufficiently decolorized with Labarraque solution. It is not as easy to see as when the tracheae retain air in their lumen, but is equally definite because of the characteristic appearance of the taenidia. The normal tracheation of the front wing is one trachea in vein 1, another branching to serve veins 2 to 4, a third trachea branching for veins 5 to 11, and a fourth trachea in vein 12. In the hind wing both veins 1a and 1c have tracheae, the branching of the third trachea serves veins 2 to 4, the next trachea serves all the remaining veins, but vein 8 has its own trachea also. The presence of two tracheae in the same vein cavity also occurs occasionally in vein 2 of the front wing, both being of about equal size in the basal segment, one going entirely into vein 2, the other branching to also serve veins 3 and 4.

An abnormality was noticed in one specimen of the wild species similar to what is occasionally observed in the domesticated species. This consists of a trachea extending directly across the membrane of the cell and appearing as the basal portion of vein 5. The specimen was clear enough to trace this trachea the whole length, and the abnormality proved to be simply a case where the trachea had become detached during the final molt and swung out of place before the fluid had been withdrawn into the body and the membranes became cemented together. In this case the trachea floated into the cell region at the extreme base and then returned to the vein cavity, abruptly swinging out again and following the fold of the membrane in almost a straight line till nearing the crossvein, when it turned forward to the anterior "vestige," half entering the

crossvein and proceeding partly in and partly out almost to the longitudinal vein. It then took a short cut across the corner of the cell and after entering this vein gave off a branch for vein 11 and then another for the crossvein and continued in a perfectly normal course. The branch into the crossvein also proceeded normally, finally entering vein 5.

One of the most notable features of the wing of the domesticated silkworm is the prominence of the marginal vein. In Comstock's figure this is indicated by the heavy lines used, heavier than any of the veins meeting it. He did not show the broadening of the ends of the veins as they approached this vein. It seems to be an undoubted vein comparable with those found in Diptera. Some wings show it very much more distinctly than others. The wild species shows this same peculiarity, but never in the same degree seen in some examples of the domesticated species, though often more evident than in those tame moths that show it least. The most extreme case I have seen is where the tips of veins 8 and 9 are connected with the margin, with a distinct reticulation as evident as in the tegmina of a grasshopper with two and three cells respectively. As far as I know such cells have not previously been noted in Lepidoptera.

There can be, I think, no doubt as to the ancestral character of *Bombyx mandarina,* though Kellogg* says that it is "not known in wild condition." The caterpillar looks, when feeding, exactly like the darker individuals of the domesticated worm but when at rest flattens itself out against a twig almost as much as a *Catocala* larva. One can sometimes observe a domesticated silkworm doing almost the same thing just after a molt. The prolegs are relatively longer, corresponding with its resting habits. The cocoon is firm and white like the common Chinese white race, but very much smaller.

The changes noted above resulting from domestication are: (1) slightly greater variability, (2) loss of distinctive peculiarities, and (3) a tendency towards extremely primitive conditions of structure.

---

*American Insects, p. 429.

# Odonatological Results of an Auto Trip Across Indiana, Kentucky and Tennessee.

By E. B. WILLIAMSON, Bluffton, Indiana.

(Continued from page 9)

Wednesday morning, July 31, we left Nashville, ate dinner at Murfreesboro, and supper at Manchester. Near Murfreesboro, at road-side wet weather pools we saw a number of *Pantala hymenaea,* and caught a few of them. At a roadside pond about seven miles northwest of Manchester, along the Murfreesboro pike, we collected *Lestes rectangularis, L. vigilax, Pachydiplax longipennis, Libellula incesta, L. luctuosa,* and *Plathemis lydia,* and saw, but did not capture, what we thought was *Epiaeschna heros. Libellula incesta* was numerous and this species and *Lestes vigilax,* which we had hitherto associated with clean glacial lakes, seemed out of place about the shallow muddy pool. In the afternoon a dragonfly was seen patrolling the edge of a woods along the road and, when Cook caught it, it proved to be a fine male of *Somatochlora tenebrosa.*

The Murfreesboro-Manchester pike, a mile or two out of Manchester crosses Duck River, a fine little stream, largely on rock, with ripples and pools, and much vegetation to and overhanging the water. We collected here Thursday forenoon, hoping to find Macromias, but only one, and that doubtfully determined as a *Macromia,* was seen and it was not captured. *Calopteryx maculata* and *Hetaerina americana* were common and one *H. titia* was taken. Other species collected were: *Lestes vigilax, Argia violacea, A. apicalis, A. translata, A. moesta, Enallagma exsulans, Hagenius brevistylus, Dromogomphus spinosus, Pachydiplax longipennis, Libellula incesta, L. pulchella,* and *Plathemis lydia. Argia translata* was the most abundant of the four species of Argias seen.

We left Manchester about 3 P. M. and, passing Wonder Cave, climbed a steep winding road from the lower land and camped that night near Monteagle on the Cumberland highlands. Some small streams crossed during the afternoon contained nothing of interest, though *Calopteryx maculata* was present, literally by hundreds. In the lower country, adjacent

to the bluff which marks the termination of the Cumberland highlands, the soil is largely sandy and there are many oaks in great variety.

We awoke early on August 2 to find our entire equipment soaked with a heavy dew, and airing and drying occupied our time till about 10 A. M. In the bushes near our camp we saw and caught a single teneral male *Libellula auripennis,* thus establishing the occurrence of this species in Tennessee.

We reached Tracy City about 3 P. M. Along the road during the ride from Monteagle we saw many Somatochloras, apparently all one species, and all captured were *tenebrosa.* A mile or two west of Tracy City a long stone bridge crosses a fine little stream, eight to twelve feet wide, with a rocky bed and clear water, the banks steep but seldom broken into cliffs and then only small ones. But the only dragonfly we found there was *Calopteryx maculata.* The vegetation here was entirely different from the deciduous forest through which we had been passing. Laurel and holly, and hemlock and pine were abundant. In a little stream near Tracy City we found a dead female *Epiaeschna heros* floating in the water. No live ones were seen.

On both sides of Tracy City were some small streams similar to a small stream near a saw mill a short distance east of Monteagle, These streams are slow flowing in sandy beds and are overgrown with brush. Adjacent to them are frequent low swampy spots. At one of these streams a female *Somatochlora tenebrosa* was ovipositing in shallow water by dipping the abdomen. Many other Somatochloras were seen here and an Aeschnine, which I think was *Nasiaeschna pentacantha,* flew back and forth at too great a height for our nets. Nearby was a glorious stalk of the orchid, *Blephariglottis ciliaris,* the only one seen. It was preserved and determined by Chas. C. Deam. Just beyond Tracy City, enroute to Jasper, we saw a dragonfly, probably a Corduline, with a dilated abdomen, flying over a field, but it disappeared and a prolonged search in several directions failed to rediscover it. That night we camped near the toll gate about three miles west of Sequatchie.

On the morning of August 3, we left camp about 9 A. M.

and descended from the Cumberland highlands to Sequatchie. About a mile north of Sequatchie, in the lowlands, we collected carefully along a small stream, fifteen to thirty feet wide, with disappointing results, the three Argias, *violacea, translata,* and *moesta, Hagenius brevistylus, Dromogomphus spinosus,* and *Pachydiplax longipennis* only being seen. The country from Sequatchie to the Tennessee River ferry was without interest. The Somatochloras, which we had observed continuously across the Cumberland highlands, disappeared when we left the highlands and descended to Sequatchie. Road side ponds in the lower country as in the highlands were frequented by the common *Plathemis lydia.*

At the Tennessee River ferry numbers of *Macromia taeniolata* were flying and a smaller number of individuals of *Dromogomphus spinosus* were seen. From the ferry to Chattanooga we came around the foot of Lookout Mountain on a wide concrete road with a beautiful view of the city.

August 4 we drove over the Dixie Highway to Rockwood where we ate dinner, having seen nothing of interest odonatologically enroute. Leaving Rockwood for Crossville we immediately climbed by three great loops over a well improved road again into the Cumberland highlands. The view over Rockwood and its environs from this point is superb. From here to Crossville, where we arrived at 4 P. M., *Somatochlora tenebrosa* again put in its appearance, and a number were seen as we drove along. The only other dragonflies seen were *Calopteryx maculata* and *Plathemis lydia.* We left Crossville at once for Jamestown, thirty-six miles to the north. Enroute the country is largely yellow pine. We saw our last *Somatochlora* at 7.30 P. M., arrived at Jamestown about 8 P. M., and put up for the night at the Mark Twain Hotel.

The next day we drove from Jamestown through Forbes, to Monticello, where we arrived about 6 P. M. During the day we crossed several good small streams but we found only Argias and *Calopteryx maculata.* For some reason no Somatochloras were seen but a *Pantala flavescens* was captured patrolling the road. Monticello is a busy little town of about 1600 people. There is no railroad. In fact, after leaving Crossville, we did not see a railroad till we reached Somer-

set, Kentucky. For this reason a brief note on the roads may be of interest. From Chattanooga to Rockwood and from Rockwood to the top of the highlands the road is good. From there to Crossville and from Crossville to Jamestown the road is poor to fair. From Jamestown to Forbes the road is very bad, and from Forbes to Albany bad. From Albany to Monticello the road is very rocky and there are many bad grades, one hill on the bank toward Monticello above the oil station being the steepest hill seen on the trip. From Monticello to Somerset the road is fair with some steep hills.

August 6 we left Monticello on the Burnside Pike for Somerset. At a small muddy roadside pond at the edge of a barnyard and near a house, about seventeen miles out of Monticello, we found a remarkable assemblage of dragonflies. A single *Lestes* was seen and when captured proved to be *eurinus*. *Enallagma aspersum* flew by hundreds or possibly thousands, while *E. civile* was comparatively rare. *Ischnura posita* and *I. verticalis* were both taken. Numbers of *Anax junius* circled the pond with frequent ovipositing females. *Plathemis lydia* was the most conspicuous larger dragonfly present and other Libellulines were *Libellula luctuosa, L. pulchella, Erythemis simplicicollis, Tramea onusta* and *T. lacerata*, the last frequently ovipositing.

After leaving this pond we soon came out on the hill tops overlooking the Cumberland valley, a beautiful and impressive view. We ferried the Cumberland and started to climb the steep grade up from the river. Near the top of this hard pull something went wrong with the Ford and we started to coast backward down the narrow and dangerous road. We rapidly gained speed in our unfortunate predicament and in a moment the Ford turned squarely upside down, fortunately in the road. I jumped and escaped without a scratch but Cook was caught under the machine and was scratched and bruised. Our equipment was badly scrambled but not much damaged. We got aid from Somerset and in a few hours were again on our way. But the collecting, for want of time, was discontinued and we hurried across Kentucky to Cincinnati, Ohio, and thence, through southeastern Indiana, back to Bluffton. So far as I am concerned a wide flung sight-seeing trip and dragonfly collecting are not a successful combination.

# Pontedera's 1718 Paper on the Cicada (Homop.).

Introduction by HARRY B. WEISS and Translation by WILLIAM HAMILTON KIRK, Ph.D., New Brunswick, New Jersey.

(Continued from page 16)

I will exhibit in the Tables the instruments of generation, with which the male and female in both classes are equipped. Then I will consider the pregnant female. For although nature has denied her the harmonic drums. yet it has compensated for this by a greater and, so to speak, extraordinary gift, giving her a wise wit and a skill out of proportion to her body. For it has hidden about the middle of the abdomen a sting as long as the fourth part of a thumb, and has hidden this in a sheath hollowed out in a little furrow and extending as far as the genital organ. This sting is rounded, firm, and equipped at the end with saws, and no art has ever invented a fitter instrument for boring; through its interior runs an open channel, the outer mouth of which ends at the saws, while the inner opens into the womb.

As soon as the Cicada has received the genital seed, she begins to look around for a place in which to deposit the already developed eggs. And having found the drv wood of some small tree, drawing her borer, she immediately sets about the work. She bores the wood and hollows out a nest, going down as deep as the length to which the sting projects beyond the belly. Then there is a great exertion in the abdomen and, the muscles pressing on all sides, the eggs are pushed out through the channel into the hole, in form they are round, pointed at both ends, and white. They are laid close, parallel to each other, but obliquely to the diameter of the wood, and in each little hollow 8 or 9 or 10 or more or fewer. Lastly the receptacle is smeared over with a kind of gummy juice, and so is protected against the inclemency of the weather. Having thus finished her first nest, she proceeds to a second, then to a third, to a fourth, until she has got rid of all her eggs. They are very productive of eggs, and have the lowest part of the belly all full of them, and for this reason, in order that they may have a belly more capable of holding so many eggs, nature has not divided them at the

waist, as it has the males. Individuals produce sometimes five hundred, sometimes six hundred eggs and sometimes I have found them to contain seven hundred.

All this which I write here for you in brief, I shall explain more fully in the Tables, adding likenesses of all these parts; for if I have shown that the organ producing the chirping is uncertain and variously explained by naturalists, more uncertain, and for the most part also false do those explanations seem to me which we have of the generation of the Cicadae. For Aristotle (who I see had no slight acquaintance with the history of the Cicada, since his account is more probable than those of the other writers) also mentions the sting, with which he says the Cicadae hollow out a place for their offspring, saying in Bk. V, ch. XXV; "They bring forth in fallow fields, boring with the sharp (point) which they have behind, like the Bruci, which also bring forth in fallows." But what this point, or (as Gaza translates it) roughness sharp at the end, which he describes in the words, "the sharp (point) which they have behind," is I do not know; certainly it is not the sting which I have found, which is placed in the region of the abdomen; this roughness of the Philosopher is placed behind, a word which Pliny, Nat. Hist. Bk. XI, ch. XXVI, copying this passage of Aristotle, explains by *in dorso* "on the back," saying; "A roughness sharp at the end on the back, with which they hollow out in the earth a place for their offspring." Theodore Gaza also in his translation uses about the same Latin words to express Aristotle's meaning; "They bring forth," he says, "in fallows, hollowing out with a roughness sharp at the end, which they have at the hinder part; as the Bruci also bring forth in soil of this kind." For which reason I am easily brought to agree with Julius Scaliger, who explains this point as situated at the buttocks; adding "The Cicadae have at their buttocks a point not unlike the sort of beak that the Gammari have." Further the extremity at the buttocks is longer in females than in males; which is common also to some Bruci. Unless the Philosopher meant this, he wrongly added the phrase "just as the Bruci," for I have never seen or read of, either in the Bruci or in any other insect, an instrument like that of the Cicadae, except

in the Fly *de'Rosai* recently discovered by the illustrious Antonius Vallisnerius, of which Aristotle had no knowledge. But as to the place for the offspring, the Philosopher himself saw that eggs were deposited in the Reeds which are used to prop vines and in the stalks of Squills; for in the same book and chapter he added "They bring forth also in Reeds with which vines are propped, hollowing out the place for the offspring in the Reeds; and in the stalks of Squills." But having in the beginning laid down that the Cicadae bring forth in fallows, he immediately added that eggs of this sort, namely those which they deposit in Reeds and in the stalks of Squills, fall into the earth. Both of which statements are false; for the eggs are not committed to the earth, nor do those which are committed to wood or Reeds (for in these I also have found the eggs of the Cicadae, but very rarely, because usually shrubs which are not empty are chosen) slip into the earth. On the contrary the Cicadae are born in these and remain in them throughout the winter. Add that nature so provided, which so arranged the articulation of the sting of the Cicadae, that not only could they not, going upwards, raise it to hollow out a nest, but could not even bend it horizontally, therefore they are compelled to bore the little hollow for their offspring by directing it downwards. Besides what is the purpose of the gumming? Certainly it keeps the little worm from getting out of the nest by creeping up and going through the open mouth. This is about what the Philosopher says about the generation of the Cicadae, which I will make plain and open by treating it more fully in the Tables. But what is said by other Philosophers is either the same or inferior, as the remarks of Baldus Angelus, Bk. VIII, ch. VII: "I," he says "can testify truly, that in earth not ploughed, or cultivated, looking toward the East, when it is dug up under scattered oaks, immediately Cicadae are dug up, not perfect but of the usual form, and many white, without wings, which were in hiding under the earth. For that reason I do not know whether they all arise from seed, as Aristotle says, or some from decayed matter. I am of the opinion that it is not repugnant to nature that these animals

should arise both spontaneously and from seed, etc." See the acuteness of the man; he had found *tettigometrae* which of necessity have wings not yet unfolded, from this he immediately excogitated very fine reasoning. But, to leave him in his rotten matter; I, rejecting these fables, shall review in the last part of the work first the origin of the Cicadae, then at what time it comes out of the nest, on what nourishment it lives, until it is hidden under the earth, and becomes a *tettigometra;* for neither in the year in which it is born does it turn out a *tettigometra,* nor in that in which it exists as a *tettigometra* does it become a Cicada. Having disposed of which matters, I shall close my book with the Aristotelian problem, "Why Cicadae are not found in places bare of trees and shrubs." I shall show that it is for this reason; first because they are deprived of the supports, on which they are accustomed to sing their marriages, and to celebrate them, then because the females seeking in vain a place proper for depositing their eggs, the race quickly perishes. And this is the meaning of the threat Dionysius of Syracuse once made against the people of Locri in Italy in the words "that for them the Cicadae shall sing on the ground," obscurely hinting that he would not only devastate their land but would so destroy it, that the Cicadae, if they wished to sing, should sing on the ground. For he intended to leave nothing standing out from the earth, not even the Cicadae; since it is not possible for them to survive when the trees are destroyed.

This, most Excellent man, I have to write to you concerning the Cicadae, and also concerning my Tables, and wish that you would as soon as possible in accordance with your friendliness and kindness write me what you think of these points, also let me know whether something should be added or omitted; conceal nothing from me. For the work will be most complete which I publish strengthened by your counsel and authority. Wherefore, whatever your reply may be, I shall follow it; if you say that there must be any addition, it shall be made; I will discard whatever you say is to be discarded; and shall even willingly suppress and delete the whole, if I understand that to be your wish.

# A Bee-Collecting Trip Across the Plains (Hym.: Apoidea, Sphecoidea).

By T. D. A. Cockerell, Boulder, Colorado.

Dr. Frank E. Lutz had spent the summer in Colorado, collecting and observing insects, and was returning home in the American Museum car during the latter half of August. As he had no companion, he kindly invited me to go as far as Lincoln, Nebraska, in order to investigate the bee-fauna along the route. I was glad to accept, as I had never collected far out on the plains, with the exception of a few hours at Sterling years ago. Dr. Lutz himself had demonstrated in former years that the bee-fauna of the eastern part of Colorado was rich in species not observed in the mountains, many of them extending northward from New Mexico or Texas. The visitor who comes out in the summer naturally collects in the higher elevations, with the result that the plains fauna remains comparatively unknown.

According to existing records, Colorado has 697 species of bees, and in addition a considerable series of forms treated as varieties or races. Certainly no other state has so large a list, but California may prove to possess more species than Colorado when it has been thoroughly explored. The Colorado list will be eventually reduced by a certain amount of synonymy, principally resulting from the matching of sexes described as different species. This reduction will, however, probably fail to balance the additions which are even yet being made at frequent intervals. It was a striking demonstration of the imperfection of our knowledge when during the past summer Mr. L. O. Jackson found *Macropis morsei* Rob. in numbers a short distance east of Boulder, adding a family (Ctenoplectridae) to the Colorado fauna.

Dr. Lutz and the writer are collecting data on the Colorado bees, and hope in due course to issue a manual or monograph which will enable the student to determine his species. Few insects are more interesting to collect and study, but at present it is practically impossible for the beginner to determine many of his species. He cannot do it efficiently even if he has access

to a good named collection, because in several genera the characters are likely to be overlooked unless special attention is drawn to them, quite distinct species being superficially almost alike. The genera, on the other hand, are usually to be recognized without much difficulty, although eminent authorities have not infrequently described species in the wrong genus.

We started from Boulder on Aug. 15, and made the first stop near Canfield, in Boulder County, alt. 5,052 feet. Collections were made at the same place from two species of plants.

(1). On *Peritoma serrulatum.*—*Bombus fervidus* Fab., *Spinoliella australior* Ckll. ♀ (one had no light median stripe on clypeus), *Perdita zebrata* Cress. ♂, ♀, *Tetraloniella excurrens* Ckll. ♀ (genus and species new to Colo.), *Anthophora occidentalis* Cress. ♀

(2) On *Grindelia decumbens.*—*Nomia bakeri* Ckll. ♀ (abundant), *Melissodes agilis subagilis* Ckll. ♂, *Halictus pectoraloides* Ckll. ♀ (new to Colo.; antennae much darker than usual).

The two additions to the fauna were known from New Mexico.

At noon we were at Wiggins, Morgan County. It was extremely hot and dusty, and the dry season had resulted in the failure of most of the crops from here on to the eastern border of the state. A small collection at Wiggins from *Peritoma serrulatum* consisted of *Megachile brevis* Say, ♀, *Spinoliella australior* Ckll. ♀, and *Perdita zebrata* Cress., ♂, ♀. *

About six miles east of Wiggins we found the small sunflower *Helianthus petiolaris* in quantity. It is not nearly so attractive to bees as the large species, and I was led to wonder whether it might differ from that in being self-fertile. This was also suggested by the failure to find hybrids, although the two readily hybridize when crossed by hand in the garden. Nevertheless, what *H. petiolaris* lacked in the quantity of its visitors, it made up in quality, as we got the following:

*Triepeolus cyclurus* n. sp., *Andrena pulchella* Rob. ♂ (new to Colo.), *Perdita laticincta* Swenk & Ckll. ♂ (new to Colo.) and *Halictus*

*Mr. S. A. Rohwer has kindly identified two wasps I obtained, and the records are of some interest. *Larropsis conferta* (Fox) ♂. At flowers of *Peritoma serrulatum,* Wiggins, Aug. 15. New to U. S. N. M. *Tachysphex propinquus* Vier. Six miles east of Wiggins, Aug. 15, dragging its prey, which Mr. Caudell identifies as *Phlibostroma quadrimaculatum* var. *pictum* Scudd.

*pruinosiformis* Crawf. ♀. Viereck has published a new name for *Andrena pulchella*, but according to my understanding of the matter, this is not necessary.

In the evening we put up at the auto camp at Fort Morgan, 4,338 ft., and before sunset I captured males of *Melissodes agilis aurigena* Cress. at *Helianthus annuus lenticularis.* The next day, Aug. 16, we found quantities of *Helianthus petiolaris* about 7½ miles west of Xenia, and collected from the flowers *Andrena haynesi* Vier. & Ckll., ♀ (new to Colo.), *Halictus pruinosiformis* Crawf., ♀, *Panurginus leucopterus* n. sp., *Perdita laticincta* Swenk & Ckll., ♂, and *P. lacteipennis* Swenk & Ckll., ♂. The *Andrena* was described from Nebraska.

Wray, reached at noon, was a disappointment. In a former year Dr. Lutz had collected a very fine and interesting series of bees here, but although there were plenty of flowers, I only got a ♀ *Melissodes confusiformis* Ckll., visiting *Helianthus annuus lenticularis.* The reason was an exceedingly hot dry wind, blowing from the south. The butterfly *Nathalis iole* was seen. We accordingly went on into Nebraska, and near Sanborn, a short distance over the line, Dr. Lutz picked up our first specimen of the so-called Colorado potato beetle, *Leptinotarsa decemlineata.* Later, at Oxford, Nebr., it was found on the traditional food-plant, *Solanum rostratum.* We camped at Benkelman, Nebr., close to the race-course. There were few flowers, but early next morning, while Dr. Lutz was ministering to the machine, I collected successfully as follows:

(1.) On *Helianthus annuus lenticularis.*—*Bombus americanorum* Fabr., worker (it was seen to go first to prickly lettuce, then to sunflower), *Halictus armaticeps* Cress. ♀, *Panurginus stigmalis* Swenk & Ckll. ♀, ♂ (form with nervures paler than in type), *Perdita albipennis* Cress. ♀, *P. lacteipennis* Swenk & Ckll. ♀.

(2.) On *Peritoma serrulatum.*—*Halictus politissimus* Ckll. ♀ (new to Nebr., described from Texas), *H. tegularis* Rob. ♀, *H. pruinosus* Rob. ♀, *H. pruinosiformis* Crawf. ♀. It seems probable that the original range of certain plants may be determined by the presence of oligotropic bees. The absence of *Perdita zebrata* on the *Peritoma* at Benkelman suggests that the plant may have spread out of its range as a weed. It was extremely interesting to note that the species of *Halictus* (subg. *Chloralictus*) had completely taken the place of the *Perdita.* climbing the long stamens and collecting the green pollen in

exactly the same manner. The species principally concerned in this, and very abundant, was *H. tegularis* Rob., described from Illinois, but known to extend westward. Possibly the competition of the *Halictus* was the true cause of the absence of *Perdita*.

After traveling over some very bad roads, we camped at Oxford. Nebr., early enough to do some collecting.

*Halictus sparsus* Rob. (described from Illinois) was taken on *Solanum rostratum*, and the following occurred on *Helianthus annuus lenticularis*: *Agapostemon texanus* Cress. ♂, *Melissodes agilis aurigenia* Cress. ♂, ♀, *Triepeolus helianthi* Rob. ♂, ♀, *Perdita albipennis* Cress, ♂.

The last collecting was done the next day, Aug. 18, at Friend. Nebr., a place which lives up to its name, providing excellent accommodations. The following were all at *Helianthus annuus lenticularis*:

*Bombus americanorum* Fabr., *Melissodes agilis aurigenia* Cress. ♂, *M. obliqua* Say, ♂ (much worn), *Triepeolus helianthi* Rob. ♂, *T. remigatus* Fabr. ♀, *Megachile parallela* Sm. ♀ (form with hair of head and sides of thorax yellowish). This is an eastern (or Mississippi valley) series of bees, and the character of the fauna was further emphasized by finding on the sunflowers numbers of the green beetle *Diabrotica longicornis* Say, which we do not find in Colorado. We also saw a Baltimore Oriole.

Arriving at Lincoln, I had my first sight of the very rich bee-collection of the University of Nebraska, and was surprised to find that there were still many species in Professor Bruner's Argentine series which I had not studied. Professor Swenk's materials of *Colletes*, including many specimens borrowed from various people and institutions, constitute the largest assemblage of this genus in the country, and it is greatly to be hoped that he will shortly continue his excellent publications on the genus. I was much pleased to meet Mr. R. W. Dawson, and to hear all about his wonderful work on *Serica*. Dr. Lutz hastened on eastward, while I spent the night in the hospitable home of Professor and Mrs. Swenk, returning to Colorado by train the following day.

The results of the trip are not extraordinary, for our day and generation, but the time will come when the story will be read with something of the feeling I had when Dr. Coues described to me the early work in Arizona, when one "shot a new bird before breakfast each morning."

The new species described below are in the writer's collection.

**Panurginus leucopterus** n. sp.

♂. Length about 5.5 mm., but the abdomen is curved like the letter J; slender, black, with scanty white hair, the face not conspicuously hairy; eyes black; face below level of antennae very pale yellow; supraclypeal mark quadrate, broader than long; lateral face marks ending at right angles to orbits, but presenting a rounded extension or lobe below the antennae; process of labrum and large mark on mandibles yellowish-white; process of labrum with strongly converging concave sides, the apex distinctly emarginate; clypeus with strong punctures, and no median groove; antennae long, entirely black; mesothorax shining, but well punctured; base of metathorax rugulose, with a broad, somewhat lustrous rim; tegulae piceous; wings milky hyaline; stigma large, rather dilute brown, the costa before it white; nervures colorless; basal nervure falling considerably short of nervulus; first recurrent joining second submarginal cell about twice as far from base as second recurrent from apex; legs black with small light spot on knees, anterior tibiae yellow in front, tarsi pale yellow, the last three joints black except anterior pair; abdomen shining, finely punctured, except the usual smooth parts.

About 7½ miles west of Xenia, Colorado, Aug. 16, at flowers of *Helianthus petiolaris*, 6 ♂. In my key in Amer. Museum Novitates, No. 36, this runs to *P. piercei*, Crawf., which is considerably larger and has dusky wings. By the milky wings it resembles *P. lactipennis* Friese, from Russia. The process of labrum is rather like that of *P. labrosiformis distractus* Ckll., but there is little resemblance otherwise.

**Triepeolus cyclurus** n. sp.

♀ Length about 10 mm.; black, the pubescent ornaments very pale yellowish, on ventral surface white; labrum, clypeus, antennae (except third joint red on outer side), scutellum and axillae black; mandibles mainly red; legs bright ferruginous, with black spurs; tegulae clear ferruginous; wings with apical margin broadly dusky, stigma and nervures black. Eyes purplish-grey; clypeus dullish, minutely granular; mesothorax with pale border at sides and behind, but not in front; a pair of broad discal stripes, pointed at each end, not quite reaching anterior margin; scutellum bigibbous; axillary spines well-developed; basal area of metathorax tensely hairy; inner side of hind basitarsi with very pale orange hair; pleura with a large space partly free from hair, dull and densely granular; abdominal markings sharply defined; first segment with a black area on each side, shaped like a bird's head, and a very broad transverse black band, subtruncate at each end, its

upper side straight and not interrupted, but the posterior pale band interrupted in middle; segments 2 to 4 with entire bands, that on 2 with a large hook-shaped extension (pointing mesad) on each side above, and at extreme sides an angular lobe; venter with white bands, that on fourth segment interrupted; pygidial area circular, shining; last ventral segment curved downward at end.

Six miles east of Wiggins, Colorado, Aug. 15, at flowers of *Helianthus petiolaris,* 1 ♀. By the curved last ventral segment this resembles the much larger and otherwise different *T. concavus* Cress. and *T. penicilliferus* Brues. In the key in Amer. Mus. Novitates, No. 23, it runs to *T. laticaudus* Ckll., which is not closely allied.

**Tetraloniella excurrens** (Ckll.).

The female from near Canfield is evidently conspecific with the type from Roswell, New Mexico; in my table in Trans. Am. Ent. Soc., xxxii, it runs nearest to *Melissodes spissa* Cress., but is easily separated by the dark tegulae and other characters. It should be noted that the clypeus is hairy all over, except a narrow line in middle, there is a fulvous tuft at tip of labrum, and the bare posterior part of first abdominal segment is extended anteriorly on each side by a rounded area.

The form *verbesinarum* (Ckll.), which I have treated as a synonym of *excurrens*, may stand as a subspecies, *T. excurrens verbesinarum*. It differs by the narrower bands on the third and fourth abdominal segments, that on the third lacking the basal thinner portion. This is probably not an individual peculiarity. The genus *Xenoglossodes*, to which the species has been referred, is a synonym of *Tetraloniella* Ashmead.

## A New Peritropis from the Eastern United States (Heteroptera-Miridae).[1]

By HARRY H. KNIGHT, University of Minnesota, St. Paul.

**Peritropis husseyi** new species.

Brownish black, dorsum alutaceous and rather closely spotted with pale; basal margin of pronotum broadly sulcate in outline, rounding laterally to the basal angles, devoid of tubercles, practically transverse

[1] Published, with the approval of the Director, as Paper No. 344 of the Journal Series of the Minnesota Agricultural Experiment Station.

on the middle one-third. Thus differing from *saldiformis* in which the basal margin is concavely sinuate, and forming three small marginal tubercles, one at the median line and a larger one at each side.

♀.—Length 3.2 mm. *Head*: width .62 mm., vertex .31 mm., length .57 mm., from front margin of eyes to tip of tylus .31 mm.; front of head more porrect and cone-shaped than in *saldiformis;* brownish black, irregularly marked with small pale spots, three or four larger spots on the strongly flattened tylus, bucculae tinged with reddish. *Rostrum*: length 2.22 mm., nearly attaining the hind margin of the first genital segment, brownish black.

*Antennae*: segment I, length .28 mm., black; II, 1 mm., nearly cylindrical but slightly thickened toward apex, not attaining the thickness of segment I, black, a small pale spot on dorsal side near middle, the extreme tip slightly pale, clothed with very fine, short pale pubescence; III, .29 mm.; IV, .34 mm.; last two segments slender, black.

*Pronotum*: length along median line .51 mm., width at base 1.17 mm., anterior angles .61 mm., lateral margins practically straight, slenderly but distinctly reflexed, anterior angles prominent, forming right angles; basal margin broadly sulcate, rounding distally to the basal angles, devoid of marginal tubercles, practically transverse on the middle one-third; calli less prominent and not so abruptly convex as in *saldiformis*, separated by a foveate groove at the median line of disk; brownish black, disk rather closely dotted with pale, spots frequently confluent, slender lower margin of propleura and a line extending distad from dorsal extremity of coxal cleft, pale. *Scutellum* nearly as in *saldiformis,* more broadly pale at apex, a few pale dots adjoining; mesoscutum exposed for a longitudinal space equal to two-thirds the length of scutellum, a curved pale mark near each basal angle. *Sternum* and pleura brownish black, basalar plate, posterior and ventral margins of epimera, pale; ostiolar peritreme pale, ostiole dusky.

*Hemelytra*: width 1.54 mm., embolar margins arcuate, somewhat reflexed basally; brownish black, rather closely spotted with pale, the spots frequently elongate or confluent, each pale point with a minute, short, scale-like pubescent hair; tip of clavus and spot at inner basal angle of cuneus pale by the fusion of several small points; cuneus blackish, a few pale points near base. *Membrane* uniformly pale fuscous, the veins scarcely darker, slightly paler bordering margin of cuneus.

*Legs*: uniformly brownish black, coxae scarcely paler at the apices; intermediate and hind tibiae paler apically, a narrow pale annulus near middle; tarsi pale fuscous, hind pair more nearly pale.

*Venter*: brownish black, pale yellowish pubescent, longest near base of ovipositor.

♂.—Length 3 mm., width 1.4 mm.; slightly smaller than the female but very similar in structure and color; genital claspers prominent and distinctive.

*Holotype*: ♀ August 11th, 1920, Washtenaw County, Michigan (R. F. Hussey); author's collection. *Allotype*: ♂ June 9th, 1917, Tuskeegee, Alabama (H. H. Knight), collected at light; Cornell University collection. *Paratype*: ♀, taken with the holotype; collection of R. F. Hussey.

Since drawing up the description of the female, the writer discovered a male specimen among some unmounted material, taken near Tuskeegee, Alabama, while collecting on a tent trap-light.

In addition to the structural difference found in the pronotum, *saldiformis* differs from *husseyi* in being more brownish than black, clavus and corium devoid of pale points, coxae white, and the first antennal segment with a white annulus on the basal half. The writer has for study, cotypes of *saldiformis* from the Heidemann collection: a multilated female "Washington, D. C."; nymph, 2 ♀ July 20, and a nymph July 28, 1890. Also a female specimen, April 24, Brownsville, Texas, which does not differ appreciably from the type specimens.

Mr. Hussey sends the following notes on the capture of the new *Peritropis*:

The two specimens taken August 11 were collected about three miles west of Ann Arbor, at the edge of the University Forestry Farm. I had worked around the pine plantations, with moderate luck, and decided to try for some Aradids in the thin oak and hickory woods across the fence. At the very edge of the woods I found a pile of white oak logs, apparently cut for fence-posts, some of them with the bark loosened, others with the bark still tight. I found a lot of Aradid nymphs and one adult, and while I was picking up some of them I saw this Mirid run out from under the bark where it was still untouched. Remembering my experience with *Fulvius imbecilis* (which I suspected this to be, since I had seen it only from the corner of my eye), and the extreme agility of that species, I was a bit too anxious and caught the bug under the edge of the bottle which accounts for the mutilated condition of the specimen. A minute or so afterward I turned up two more, of which I got one; the other escaped while I was busy. I saw no more of them that afternoon, nor was I able to find any on August 15, September 1, and September 3, when I revisited the place. I examined not only this one log-pile, but all the other stacks of wood that I ran across on the University Farm. This *Peritropis* is a moderately active form, but by no means as quick and agile as *Fulvius*.

## A New Tachinid Parasite of the Codling Moth (Dip.).

BY J. M. ALDRICH, Associate Curator, U. S. National Museum, Washington, D. C.

The new species belongs to the genus *Anachaetopsis*, heretofore known only in two European species. Our American species is so much like *ocypterina* Zett., the genotype (as represented in the National Museum by specimens received from Dr. Villeneuve), that except for a few characters a description may be drawn to cover both. We have, however, only females of the new species.

### ANACHAETOPSIS Brauer and Bergenstamm.

Brauer and Bergenstamm, Zweifl. Kais. Mus., IV, 1889, p. 106; VI, 1893, p. 148.—Brauer, Verh. k. k. Z. B. Ges. Wien, 1893, 490.—Baer, Die Tachinen, Berlin, 1921, pp. 82, 146.

With distinct macrochaetae on head, thorax and abdomen; both sexes with orbitals and wide front; antennae long, reaching edge of mouth, third joint more than twice as long as second; arista with penultimate joint variable, sometimes more than twice as long as thick; vibrissae well developed, at oral margin, not approximated; facial ridges bristly almost to the level of the arista, the frontal rows descending nearly as far; parafacials narrow, bare; palpi normal; proboscis small; eyes bare.

Wings of normal shape, veins bare except base of third, apical cell petiolate, the petiole a little less than one-half as long as hind cross-vein; costal segment before tip of first vein less than one-third the following one; costal spine distinct; apical cross-vein more oblique than the hind; third vein ending only a little before the tip.

Chaetotaxy: ocellars normal; verticals 2, the inner large; frontals about 6, the second from above large and reclinate, the lowest almost at the level of the arista; orbitals two in both sexes; vibrissae large, at oral margin; facial ridges with row of bristles almost meeting frontals. (Thorax) Acrostichals 3, 3; dorsocentrals 3, 3, the hindmost large; humerals 3; posthumerals 2-3, including the "anterior intraalar;" notopleurals 2; supraalars 3, the middle large; intraalars 3; postalars 2, one large; scutellum with two large lateral pairs, and sometimes a very minute hairlike pair of apicals, disk with a few tall, straight spines; mesopleura with one large anterior, a row at hind edge, and a partial row beginning just behind the humerus and extending downward; sternopleurals 2, 1; pteropleural 1, smallish; hypopleurals, the usual row. (Abdomen) First segment with one lateral and one median marginal; second segment with one discal, one lateral and one median marginal; third with one discal and a marginal row of four pairs; fourth with a discal row of four pairs and a few smaller marginals.

All the discals are large and erect. (Legs) Front tibiae with one bristle on outer hind side below middle, and a row on front side; middle tibiae with one bristle on outer front side, one inner, and two on outer hind. (Wing) Costal spine distinct; third vein with 2-3 quite large setules at base.

**Anachaetopsis vagans** new species.

♀. Wholly black in ground color, including palpi; front shining on upper half, then becoming silvery, which extends down the parafacials; third antennal joint about two and one-half times the second; mesonotum and pleurae subshining black with distinct white pruinosity; abdomen shining black, not quite polished, with faint but visible narrow anterior border of white pruinosity on second and third segments. Hind tibia with 10-12 small rather regular bristles on outer hind side.

Length 3.7 to 4.2 mm.

Three females, reared at Medford, Oregon, September 6, 1922, from the Codling Moth, *Carpocapsa pomonella* Linn. (Quaintance No. 9305).

*Type.—Female,* No. 25798 U. S. Nat. Mus.

The European type species, *ocypterina* Zett., differs only in having the abdomen highly polished, without any pruinose bands; and in having on the outer side of the hind tibia a row of only about six irregular bristles, some of which are quite large; the third antennal joint appears to be slightly longer. In the male of *ocypterina* (and presumably in the unknown males of *vagans*), the third antennal joint is five times as long as the second.

*Ocypterina* has been reared from Pterophorid moths in Europe (Baer). No particulars regarding the reproductive physiology have been made known; one female shows a blunt point in the terminal abdominal segment, about as in *Phorocera claripennis,* from which macrotype eggs might be surmised.

In regard to the relationships of the genus, the type species was described as *Tachina* (Zetterstedt, Dipt. Scand., iii, 1844, 1077); but the author in his analysis of the species, p. 1007, indicated that it would go in *Degeeria* Mg. Brauer and Bergenstamm place it next to *Phorichaeta* Rond., which, however, has a row of bristles down the parafacials. Townsend has placed the specimens in the National Museum next to *Chaetophleps polita* Coq., which he makes the type of *Euchaetophleps* new genus; but this species is a synonym of *Hypostena nitens* Coq., which Townsend makes type of the new genus *Oxynops,* in an entirely different tribe some distance away. This species *nitens,* under whatever genus, seems to be the nearest American relative; it has the apical cell narrowly open.

There is a second European species, *morio* Fall., which has yellow palpi, facial ridges less bristly, and apical cell open or barely closed.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., FEBRUARY, 1923.

## Entomology at the Convocation Week Meetings, December, 1922.

The meetings of the American Association for the Advancement of Science and of the Associated Scientific Societies were held December 26 to 30, 1922, nominally in Boston, Massachusetts, but for the most part actually in Cambridge, which is a separate municipality with its own mayor. All of the sessions concerning entomology, as well as most other biological sciences, found place in the magnificent new (1916) buildings of the Massachusetts Institute of Technology, on the Cambridge side of the Charles River (Back Bay) at Massachusetts Avenue. The great extent of these structures made it possible to pass from the meeting of one society to another without going out of doors, a very comfortable condition during the snow storm, which lasted all day on December 28 and for a part of the 29th. It was necessary, to be sure, to go out to nearby Walker Memorial Hall, where tasty luncheons were served on the cafeteria plan, but no complaint can justly be made of this arrangement. We are grateful for all the conveniences and dispositions which made the whole series of meetings very agreeable and profitable.

Papers relating, in whole or in part, to the tracheate Arthropods were listed on the programs of

| | |
|---|---|
| American Association for the Advancement of Science, general sessions | 1 |
| The same, Section E, Geology and Geography | 1 |
| American Society of Zoologists (alone) | 10 |
| The same with the Ecological Society of America | 1 |
| The same with the Botanical Society of America (joint Genetics section) | 7 |
| The same with the Ecological Society and the American Society of Naturalists | 2 |
| Entomological Society of America (alone) | 40 |
| American Association of Economic Entomologists (alone, but including its sections on Apiculture and Horticultural Inspection) | 76 |
| The same with the American Phytopathological Society | 2 |
| Ecological Society of America (alone) | 6 |
| American Nature Study Society | 1 |
| Society of American Foresters with Section K (Social and Economic Sciences), A. A. A. S., and New England Forestry Congress | 2 |
| A. A. A. S., Section N, Medical Sciences | 2 |
| Total | 151 |

These 151 papers were concerned with the following subjects:

General Entomology 11
Methods 1
Cytology 1
Anatomy 8
Physiology 9
Ontogeny 5
Genetics 7
Geographical Distribution 8
Taxonomy 4
Ecology 28
Evolution 2
Parasites of Animals 4
Relations to Man 3
General Economic Entomology 12
Insects injurious to Plants 25
Insecticides and Fumigants 15
Apiculture 8
Other Special Insects 1

---

Onychophora 1
Araneina 1
Acarina 2
Insects (more than one Order) 9
Orthoptera 2
Isoptera 2
Plecoptera 1
Ephemerida 2
Odonata 2
Neuroptera 1
Homoptera 13
Heteroptera 5
Coleoptera 12
Hymenoptera (exclusive of *Apis*) 5
*Apis* 5
Trichoptera 2
Lepidoptera 14
Diptera (exclusive of *Drosophila*) 14
*Drosophila* 3

Many of the figures in this second list are duplicated; thus a paper on the Genetics of *Drosophila* appears under both of these headings.

Among the more pretentious events were:

The First William Thompson Sedgwick Memorial Lecture by Prof. Edmund B. Wilson, of Columbia University, on *The Physical Basis of Life.*

The annual address of the Entomological Society of America by Prof. W. M. Wheeler on *The Physiognomy of Insects,* dealing largely, but not exclusively, with the shapes of the heads of ants, as conditioned chiefly by the size and position of the flexor muscles of the mandibles.

The annual presidential address to the American Association of Economic Entomologists by Prof. J. G. Sanders, Director of the Bureau of Plant Industry, Pennsylvania Dept. of Agriculture, on *Whither is Entomology?*

The symposia of the Entomological Society of America on *Adaptations of Insects to Special Environments* (21 speakers); of the Economic Entomologists on *Standards for the Training of Men who are to enter Professional Entomology* (7 speakers), and with the American Phytopathological Society on *Plant Quarantines* (5 speakers, 2 of them for entomology); of the Zoologists, Ecologists and Naturalists on *Geographical Distribution* (9 speakers, 1 of them on Insects, 1 on Onychophora).

The dinner of the American Nature Study Society in honor of Mrs. Anna Botsford Comstock, who is retiring as Professor of Nature Study at Cornell University, on December 28.

The annual dinner of the Entomologists on December 29.

The total of 151 papers is almost exactly the same as that recorded (152) in the NEWS for February, 1922 (pages 53-55), as having been listed on the corresponding programs at Toronto, in December, 1921.

# Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

## Paradichlorobenzene as a Fumigant in the Entomological Museum.

During the past year the writer has made tests with paradichlorobenzine to determine its value as a fumigant and deterrent of insect pests in the entomological museum. This material was introduced into boxes and drawers which were infested with the confused flour beetle (*Tribolium confusum*). It was found that the beetles were killed in from one to six hours, the time depending upon the amount of crystals introduced. Tests were also made on the effectiveness of paradichlorobenzine in killing dermestid larvae which commonly infest neglected museum drawers.* A few crystals of this chemical, when placed in a tight drawer, were found to kill dermestid larvae in from one to four hours. This chemical not only acts as a deterrent of pests which would enter insect cases, but will actually kill those that cannot retreat within a limited time. Paradichlorobenzene, which is now readily obtained in the market, comes in crystalline form and can be handled much as napthalene, but when used in the insect cabinet has the advantage of killing the pests which are confined in the cases. Paradichlorobenzene evaporates somewhat more rapidly than napthalene, still a half ounce placed in a tight case will last from five to eight weeks, and the gas may still be effective for three or four months in unopened cases. This material is the most convenient and satisfactory fumigant for insect cases that the writer has used, in fact, proving so successful that carbon disulphide fumigation has been discontinued in the care of the insect collections at the University of Minnesota.—Harry H. Knight, University of Minnesota.

---

## A New Character for Differentiating the Families of Muscoidea (Dipt.).

Every beginner in the study of the Muscoidea has found it difficult to distinguish with certainty what family some forms belong to and there has long been much uncertainty as to the validity of the distinction between the Dexiidae and the Sarcophagidae. Two or three years ago I had occasion to make an exhaustive examination of the Tachinidae and related forms to discover if there were present some hitherto unconsidered character which would enable any entomologist to recognize the different families with more certainty than is at present possible. After some careful comparative work I finally decided that it is invariably possible to distinguish between the Sarcophagidae, Muscidae, and Calliphoridae on one hand, and the Tachinidae and Dexiidae

on the other by the shape of the metanotum. In the last two this is biconvex in profile, there being a small but distinct convexity just below the scutellum which is absent in the members of the other three families known to me.

This character is so constant that it must have a fundamental significance and it is remarkable that in the group which we in this country consider as the Tachinidae practically all the species which are inquilines or parasites in the nests of bees, such as the genera *Metopia*, *Senotania*, etc., lack the basal convexity and are definitely allied in this respect with Sarcophagidae. I consider, however, that they are entitled to separate family rank, being more readily separable from Sarcophagidae than are the Muscidae from the Anthomyiidae. Some European workers have lumped these genera with the Sarcophagidae.

I make this character known at this time to enable other workers to try it out as fully as possible.—J. R. Malloch, Biological Survey, Washington, D. C.

---

## Let Us Try to Help Each Other (Dip.: Borboridae).

In the Tijdschrift voor Entomologie, lxiv, p. 120, Dr. Duda (I suppose we all know his, the learned doctor's, individual name) has a paper entitled "Fiebrigella und Archiborborus, zwei neue sudamerikanische Borboridengattungen," in which two new genera of the dipterous family Borboridae are proposed. In spite of the numerous published articles and recommendations on the publication of scientific papers, and the recommendations of the International Committee on Nomenclature, as to the designation of types, we have here an instance of either indifference, ignorance or carelessness in the preparation of the paper. It is regrettable that this is true of so many valuable contributions.

*Archiborborus* is proposed for *Borborus hirtipes* Macq. and the following new species: *submaculatus* (Chile), *maculipennis* (Chile), *setosus* (Bolivia), *calceatus* (Colombia), *orbitalis* (Peru and Bolivia) and var. *latifrons* (Peru). No mention of a genotype or even type specimens for the species (this latter a common omission of authors). There should have been a genotype designated for *Archiborborus*, but apparently there is none. I therefore designate *Archiborborus submaculatus* Duda the type of *Archiborborus*.

For the habitat of *Fiebrigella verrucosa* n. g., n. sp., one must refer to the general discussion of the genera in the beginning of the paper. None is given in the proper place under the description of the genus and species. This is very tantalizing.

A table of the genera of the Borboridae is included in the paper, which will no doubt prove useful to students of that family.—E. T. Cresson, Jr.

### A Remarkable Butterfly (Lep.: Papilionidae).

As far as is certainly known at present, the *Ornithoptera* group of Papilios is unrepresented in Africa, but from reports that reach England from time to time it is thought that this group may be represented or that a third species of giant Papilios exists, similar to the *antimachus* and *zalmoxis*, or even perhaps a hybrid between the two. There is, for instance, an authenticated report of such an insect having been seen in Liberia which rather bears out my own experience when crossing the higher Lindi River in the Stanleyville district of the Belgian Congo. I was on my way to Stanleyville from a place named Irumu, near Lake Albert, and having arrived at the Lindi River, which at this point is a good two hundred yards wide, I was crossing it in a canoe when from the opposite bank came flying towards me a large insect of the *antimachus* type but of heavier build and flight. It circled over the water and round and above the canoe, where I got a good look at it. The hind wings appeared to me to be a rich brown, spotted and barred with black at the edges, the fore wings having each a broad transverse bar across them of a vivid blue-green on a ground color of black. The insect eventually flew away over the trees, and although I waited there for the rest of the day it never returned. Some five or six miles farther on, and in the forest, I thought I saw a similar insect, but I could not be sure that this was not a *zalmoxis*.

I put down this record for what it is worth, as the insect may subsequently be captured by some lucky individual. I have of course been asked why I did not stay a week or a month on the spot and attempt to capture so great a prize; the answer is that at that time (not long after the signing of the Treaty of Peace) passages to England were exceedingly difficult to obtain, and having booked and paid for two berths (for myself and my wife) on a homeward bound steamer six months in advance, I was unable to give the time necessary for the purpose without losing our passages. As a matter of fact, I reached my port of embarkation with only two days to spare.

T. ALEXANDER BARNS.

Mr. Barns is once again in Africa in quest of this rare insect, but at the time of writing no specimens have been seen. Confirmation of the existence of this butterfly has been supplied by my friend, Monsieur F. Le Cerf, of the Paris Museum.

A certain Sergeant Monceaux (now Captain), when employed on the Franco-Liberian Boundary Commission for the delimitation of the frontier between Liberia and French Guinea, made a collection of over 4,000 Lepidoptera which he brought to the Paris Museum. He stated as having seen in the region of the Upper Sasandra River a large butterfly drinking at a pool of water on the road. It closed and opened its wings alternately, and the observer was able to get fairly close to

it before it flew away. The sergeant stated that the wings of this butterfly were very long and for the greater part of a brilliant blue color.

Monsieur Le Cerf showed Sergeant Monceaux several species in the museum, including *P. zalmoxis*, but he recognized none of them as being the insect he had seen. The sergeant pulled out some other drawers and seeing *P. antimachus*, exclaimed: "C'est comme cette espèce là, mais avec beaucoup de bleu brilliant et encore plus grand." (It is like that species there, but with a lot of bright blue and still larger.)

This butterfly has been observed also on two occasions in Nigeria.

—G. TALBOT.

(Copied from "Wonderland of the Eastern Congo," pages 253-254 and 267; author, T. Alexander Barns, F. R. G. S., F. Z. S., F. E. S. G. P. Putnam's Sons, London and New York.)

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **9**—The Entomologist, London. **24**—Annales de la Societe Entomologique de France, Paris. **52**—Zoologischer Anzeiger, Leipsic. **68**—Science, Garrison on the Hudson, N. Y. **69**—Comptes Rendus des seances de l'Academie des Sciences, Paris. **70**—Journal of Morphology, Philadelphia. **72**—The Annals of Applied Biology, London. **76**—Nature, London. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **111**—Archiv fur Naturgeschichte, Berlin.

**GENERAL. Bedel, Louis**—Notice necrologique sur. . . **24**, xci, 165-89. **Gillett, F.**—Light trap experiments in connection with temperatures, etc. **9**, lv, 274-7. **Index generales**—Annuaire general des universites . . . Publie sous la direction de R. de Montessus de Ballore. Paris, 1921, 1845 pp. **Parshley, H. M.**—On the formation of family names like Tingidae. **68**, lvi, 754-5.

**ANATOMY, PHYSIOLOGY, ETC. Bowen, R. H.**—Studies on insect spermatogenesis. **70,** xxxvii, 79-194. Notes on the occurrence of abnormal mitoses in spermatogenesis. **100,** xliii, 184-202. **Brocher, F.**—Etude experimentale sur le fonctionnement du vaisseau dorsal et sur le circulation du sang chez les insectes. V. **24,** xci, 156-64. **Bugnion, E.**—Les organes lumineux du ver luisant provencal (Phausis delarouzeei). (Festschr. fur Zschokke. N. 33. Basel). **Crozier, W. J.**—"Reversal of inhibition" by atropine in caterpillars. **100,** xliii, 239-45. **Desoil et Delhaye**—Essais d'infestation experimentale du tube digestif par oeufs et larves de Calliphora vomitoria. **69,** lxxxvii, 1303-5. **Mallock, A.**—Divided composite eyes. **76,** cx, 770-1. **Metz, C. W.**—Chromosome studies on the Diptera. IV. Incomplete synapsis of chromosomes in Dasyllis grossa. **100,** xliii, 253-66. Association of homologous chromosomes in tetraploid cells of Diptera. **100,** xliii, 369-73.

**ARACHNIDA AND MYRIOPODA. Gudger, E. W.**—Spiders as fishermen. (Nat. Hist., New York, xxii, 565-8).

**ORTHOPTERA. Giglio-Tos, E.**—Genera insectorum. Fasc. 177. Mantidae, subf. Eremiaphilinae.

**HEMIPTERA. Altson, A. M.**—On the young larvae of Lyctus brunneus. **72,** ix, 187-96. **Barber & Weiss**—The lace bugs of New Jersey. (Circ. 54, New Jersey Dept. Agr. Bur. Sta. & Insp.). **Schmidt, E.**—Beitrage zur kenntnis aussereuropaischer zikaden. (Homoptera). **111,** 1922, A, 11, 262-6.

**LEPIDOPTERA. Meyrick, E.**—Exotic microlepidoptera. Vol. II, p. 545-608. [many Neotropical species described.]. **Mousley, H.**—Further notes on the Rhopalocera of Hatley, Stanstead Co., Quebec, 1921-22. (Can Field-Nat., xxxvi, 141-2.) **Seitz, A.**—The Macrolepidoptera of the World. Fauna indoaustralica. No. 118. Fauna americana. Part. 111-12.

**Benjamin, F. H.**—Notes on Exyra semicrocea and form hubbardiana. **4,** liv, 220-1. **McDunnough, J.**—Some apparently undescribed Noctuidae. **4,** liv, 236-8.

**DIPTERA. Feuerborn, H. J.**—Das hypopygium "inversum" und "circumversum" der dipteren. **52,** lv, 189-212. **Smith, K. M.**—A study of the life-history of the onion fly (Hylemyia antiqua). **72,** ix, 177-83. **Surcouf, J.**—Genera insectorum. Fasc. 175. Tabanidae. **Wesenberg-Lund, C.**—The pupal stage of the mosquitoes. (Festsch. z. Feier d. 60 Geburts von Zschokke, Basel, 1921, N. 23).

**McDunnough, J.**—Two new Canadian Tabanidae. **4,** liv, 238-40.

**COLEOPTERA. Boppe, P.**—Genera insectorum Fac. 178. Cerambycidae, subf. Disteniinae-Lepturinae. **Chatanay, J.**—Genera

insectorum. Fasc. **176**. Tenebrionidae, subf. Zophosinae. **Chittenden, F. H.**—The cocklebur billbug. **4**, liv, 217-20. **Fenyes, A.**—Genera insectorum. Fasc. 173c, Staphylinidae, subf. Aleocharinae, p. 415-53. **Roberts, A. W. R.**—On the life history of "wireworms" of the genus Agriotes, with some notes on that of Athous haemorrhoidalis. **72**, ix, 306-24.

**HYMENOPTERA. Emery, C.**—Genera insectorum. Fac. 174b. Formicidae, subf. Myrmicinae, p. 95-206. **Garlick, W. G.**—Concerning the feeding habits of the purslane sawfly larva. **4**, liv, 240. **Mayor, A. G.**—The tracking instinct in a tortugas ant. (Carnegie Inst. Wash., Pub. No. 312, p. 103-7.).

# Doings of Societies.

### Entomological Society of America.

The seventeenth annual meeting of the Entomological Society of America was held in Cambridge, Massachusetts, in the Buildings of the Massachusetts Institute of Technology, on December 26, 27 and 29, 1922. The meetings were unusually well attended, the attendance ranging from about 75 to 250 in the different sessions.

Seventy-four new members were elected during the past year, bringing the total membership to 652, the largest in the history of the society.

Professor T. D. A. Cockerell, of the University of Colorado, was elected president; William S. Marshall, of the University of Wisconsin, was chosen first vice-president; F. E. Lutz, American Museum of Natural History, New York, second vice-president, and C. L. Metcalf, University of Illinois, secretary-treasurer.

Other elections were: Managing Editor of Annals, Prof. Herbert Osborn, Ohio State University; additional members of Executive Committee, Arthur Gibson, Dominion Entomologist, Ottawa, Canada; Dr. William A. Riley, University of Minnesota; Prof. R. A. Cooley, Agr. Experiment Station, Bozeman, Montana; Charles W. Johnson, Boston Society of Natural History; Dr. E. P. Felt, State Entomologist, Albany, New York, and Prof. A. L. Melander, State College, Pullman, Washington.

The Society voted to raise the annual dues from $2.00 to $3.00, effective January 1, 1924.

Professor J. J. Davis, of Purdue University, was appointed Treasurer of the Thomas Say Foundation, to succeed Dr. E. D. Ball, resigned.

Messrs. R. A. Cooley, R. W. Harned and Guy C. Crampton were elected as new members of the Editorial Board of the Annals.

The Society approved the constitution for the Union of American Biological Societies, as published in *Science* for September 29, 1922, and appointed A. N. Caudell and A. G. Böving as the representatives

of the Society to attend such meetings as may be called in Washington during the coming year.

The following subject was selected for the Symposium at the Cincinnati meeting in 1923: "Methods of Protection and Defense Among Insects."

C. L. METCALF, *Secretary*.

---

## The American Entomological Society.

Meeting of April 27, 1922, in the hall of the Academy of Natural Sciences of Philadelphia. Eight persons present, Dr. Henry Skinner presiding.

Mr. Cresson, of the Property Committee, reported the following additions to the Cabinet: 7 named Hymenoptera from Hawaiian Islands, from Dr. D. M. Castle; 2 paratypes from Michigan, of *Enocherus liljebladi* Wal. (Coleop.) from A. B. Wolcott; 81 Hymenoptera, 96 Diptera, U. S., Dr. Victor A. Loeb; 41 Coleoptera (Tenebrionidae) from U. S., from Dr. F. E. Blaisdell.

Dr. Arthur D. Whedon, 525 South High Street, West Chester, Pa., and Mr. John C. Holinger, Girard Trust Co., Phila., were elected to membership in the Society.

HYMENOPTERA.—Dr. Bradley, of Cornell University, exhibited a new first American species of the genus *Incomathis* (Hymenoptera), there being four other species known.

LEPIDOPTERA.—Mr. Williams exhibited some slides and drawings of the male genitalia of the larger Hesperidae and made some remarks on the characters disclosed.

Dr. Skinner remarked on the "Corona," as he designated the curious chitinous and membraneous appendages found in some species of Hesperidae at the apex of the aedoeagus.

DERMAPTERA.—The combined exotic collection of Dermaptera was exhibited by Messrs. Rehn and Hebard. Two hundred and forty-four species are now included, representing ninety genera. In the collection are also the types of twenty-four species. Burr's treatment of the Order in the *Genera Insectorum* was shown, which included one hundred and forty-six genera, the number of subsequently described genera brings the total up to approximately one hundred and sixty. The growth of this portion of the collection has in recent years been very rapid and it was pointed out that the Dermaptera are among the most difficult Orders of insects to secure quantity. The North American collection of Dermaptera is now complete, containing material of every species found north of the Mexican border.

Dr. Skinner spoke of Dr. Malcolm Burr, the Dermapterist, and of a visit to his home and collections, followed by a further tribute to Dr. Burr and his work by Mr. Rehn and Mr. Hebard.

R. C. WILLIAMS, *Recording Secretary*.

# OBITUARY.

HENRY JOHN ELWES, F. R. S., F. E. S., was born in 1846 and died at his home, Colesborne Hall, Cheltenham, England, November 26th, 1922, after a long illness.[1] He was educated at Eton and subsequently joined the Scots Guards, in which he became Captain. His activities were big game hunting, horticulture, agriculture, systematic botany and entomology. He traveled extensively and covered a large part of the world and made collections in the Himalayas, Andes and the mountains of Japan and China, as well as in the Rocky Mountains and other parts of North America. It botany he was favorably known by his monograph on the lilies and his great work on *The Trees of Great Britain and Ireland.* He was an authority on the Palaearctic Rhopalocera and published many interesting and valuable papers on these butterflies. The papers on *Parnassius* and *Erebia* are well known, also an annotated list of the Rhopalocera of Sikkim.

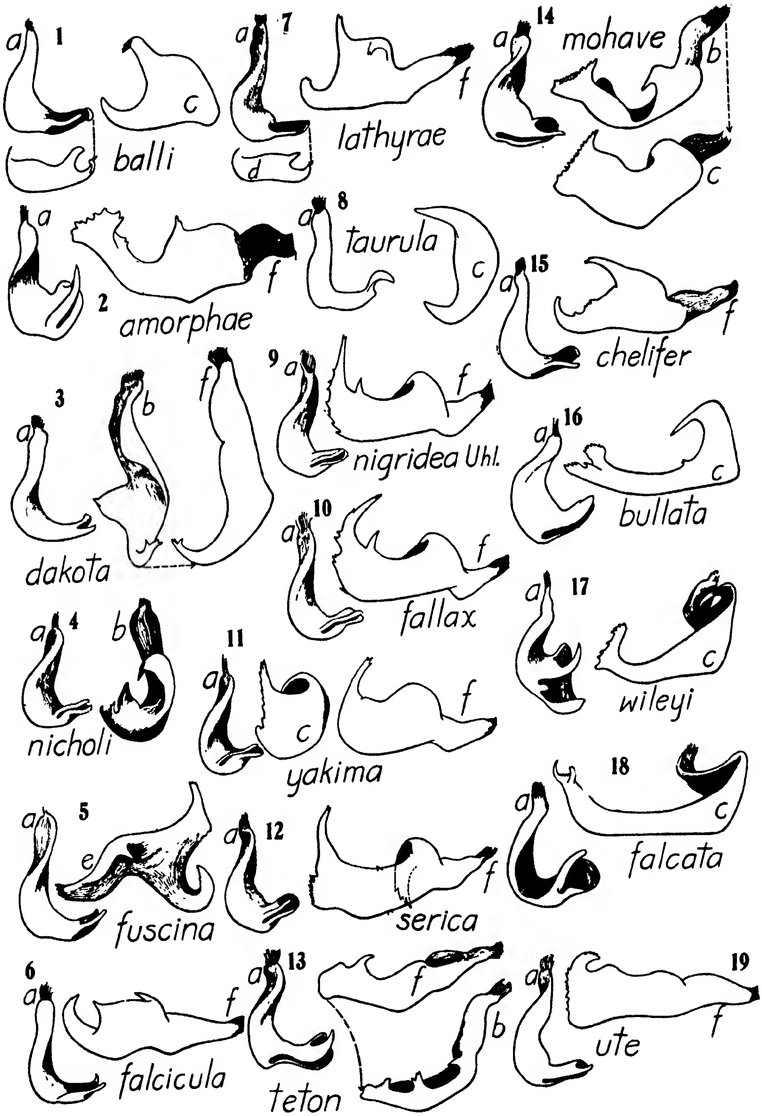
He was elected a member of the Royal Society in 1897 and President of the Entomological Society of London for the years 1893 and 1894. In 1897 he was elected a Corresponding Member of The American Entomological Society.

As stated above, Mr. Elwes collected in this country and took a great interest in its butterfly fauna. His revision of the genus *Argynnis*[2] included the species found in North America and the same is true of his paper on the genus *Erebia*,[3] in which he described a high altitude form of *epipsodea* under the name *brucei*. Another interesting paper is *On a Collection of Lepidoptera from Arctic America.*[4] With this is a color plate of rare species, including *Colias boothi* Curtis and *Erebia fasciata* Butler. A large part of his valuable collection was presented to the British Museum and the remainder was purchased by Mr. J. J. Joicey.

HENRY SKINNER.

[1]Entomologists Record, 1922, xxxiv. By G. T. Bethune-Baker.
[2]Trans. Ent. Soc. Lond., 1889, p. 535.
[3]Trans. Ent. Soc. Lond., 1889, p. 317.
[4]Trans. Ent. Soc. Lond., 1903, p. 239, pl. ix.

The December, 1922, issue of ENTOMOLOGICAL NEWS was mailed at the Philadelphia Post Office, December 11, 1922.




MALE GENITAL CLASPERS OF SPECIES OF LOPIDEA.—KNIGHT.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

VOL. XXXIV MARCH, 1923 No. 3


CONTENTS



# A Fourth Paper on the Species of Lopidea (Heteroptera, Miridae).[1]


By HARRY H. KNIGHT, University of Minnesota, St. Paul, Minnesota.


(Plate II.)

**Lopidea amorphae** new species (Plate II, Fig. 2).

♂. Length 5.9 mm., width 2 mm. *Head:* width 1.1 mm., vertex .34 mm. *Antennae:* segment I, length .60 mm.; II, 2.09 mm., thickness .114 mm., tapering to more slender on apical half; III, 1.2 mm.; IV, .40 mm. *Pronotum:* width at base 1.84 mm. Genital claspers (fig. 2) indicate a very close relationship with *reuteri*, but in the large series examined the distal portion of the right clasper shows differences that are constant. Hemelytra with red areas bearing fine yellowish pubescence, while in *reuteri* the same areas bear black pubescent hairs; smaller than *reuteri* and more yellowish in color, the majority of specimens more yellowish than red. Breeds on *Amorpha fructicosa* where the nymphs and adults were taken in numbers.

♀. Length 6.3 mm., width 2.3 mm., very similar to the male in form and coloration.

[1]Published, with the approval of the Director, as paper No. 353 of the Journal Series of the Minnesota Agricultural Experiment Station.

*Holotype*: ♂ July 8, 1922, Ramsey County, Minnesota (H. H. Knight), taken on *Amorpha fructicosa,* found growing on bank of Mississippi river; Minnesota University collection. *Allotype*: same data as type. *Paratypes*: 16 ♂ 14 ♀, taken with types; 9 ♂ 26 ♀ July 18, 1922, type locality (H. H. Knight). 2 ♂ 2 ♀ July 2, 1920, type locality (P. B. Lawson).

**Lopidea lathyrae** new species (Plate II, Fig. 7).

♂. Length 5.9 mm., width 1.9 mm. *Head*: width 1.11 mm., vertex .65 mm. *Antennae*: segment I, length .65 mm.; II, 2 mm., cylindrical; III, 1.58 mm.; IV, .61 mm. *Pronotum*: width at base 1.71 mm. Size, form and color very suggestive of *confluens* Say; deep red, legs, antennae, pronotal disk except lateral and anterior margins, scutellum, broad stripe each side of commissure and membrane black; clothed with fine yellowish pubescence on the red areas but black over the dark surface, with a few sericeous, yellowish pubescent hairs about margin of calli. Genital claspers· (fig. 7) distinctive of the species.

♀. Length 6.2 mm., width 2.2 mm.; very similar to the male but with embolium and outer half of cuneus pale.

*Holotype:* ♂ July 6, 1919, Anoka County, Minnesota (H. H. Knight); Minnesota University collection. *Allotype*: taken with the type. *Paratypes: 75* ♂ ♀, taken with the types on *Lathyrus venosus*. DAKOTA—3 ♂ 6 ♀ July 30, 1920, Turtle Mountains (T. H. Hubbel). MINNESOTA—♂ July 10, 1920, Morrison County (A. A. Nichol). ♀ July 2, 1919, Mille Lacs County (V. R. Haber.) ♂ Aug. 6, 1910, Koochiching County. 5 ♂ 1 ♀ June 19, 1921, Ramsey County (H. H. Knight.) CANADA, MANITOBA—♀ July 20, 1915, 2 ♀ July 18, 1916, Aweme (N. Criddle). SASKATCHEWAN—♂ July, 1922, Saskatoon (A. E. Cameron).

In Anoka County the writer found this species so numerous that in spots the host plants were largely killed. From this observation it would appear that this insect may be regarded as a potential pest of cultivated vetches.

**Lopidea balli** new species (Plate II, Fig. 1).

♂. Length 5.7 mm., width 2.2 mm. *Head*: width 1.21 mm., vertex .70 mm. *Antennae*: segment I, length .63 mm.; II, 2.2 mm., thickness .10 mm., very slightly more slender on apical one-fourth. *Pronotum*: width at base 1.74 mm. Genital claspers (fig. 1) indicate a close relationship with *lathyrae,* but in form broader and with less blackish on

the dorsum; pronotum red to roseous, calli scarcely darkened; pubescence nearly as in *lathyrae*, but basal half of clavus bearing sericeous, silvery pubescence, the dark hairs on embolium and outer half of corium becoming yellowish apically.

♀. Length 6.1 mm., width 2.2 mm.; very similar to the male in form and coloration.

*Holotype:* ♂ July 22, 1900, Denver, Colorado (E. D. Ball); author's collection. *Allotype:* ♀ Aug., 1906, Glen, Sioux County, Nebraska (H. G. Barber). *Paratypes*: 1 ♂ 1 ♀, taken with allotype.

**Lopidea chelifer** new species (Plate II, Fig. 15).

♂. Length 5.3 mm., width 1.9 mm. *Head*: width 1.17 mm., vertex .64 mm. *Antennae:* segment I, length .63 mm.; II, 2.03 mm., nearly cylindrical; III, 1.36 mm.; IV, .39 mm. *Pronotum*: width at base 1.66 mm. Genital claspers (fig. 15) indicate a relationship with *balli*, but differences are apparent, the dorsum also more thickly clothed with dusky to black pubescence; femora pale fuscous and with black dots.

*Holotype*: ♂ Aug. 1-15, 1916, Jemez Springs, New Mexico (J. Woodgate); author's collection.

**Lopidea dakota** new species (Plate II, Fig. 3).

†*Lomatopleura caesar* Uhler, Hemip. Colo., p. 31, 1895.

♂. Length 6.4 mm., width 2.5 mm. *Head*: width 1.22 mm., vertex .77 mm. *Antennae*: segment I, length .77 mm.; II, 2.44 mm., thickness .09 mm., tapering to slightly more slender apically; III, 1.57 mm.; IV, .57 mm. Size and color very similar to *reuteri;* genital claspers (fig. 3) indicate a close relationship with *instabilis* but the antennae are more slender; dorsum clothed with stiff, suberect black hairs which in length nearly equal thickness of antennal segment II.

♀. Length 6.9 mm., width 2.4 mm.; more robust than the male but very similar in form and coloration. Named after the Dakota Indians, the largest division of the Siouan family.

*Holotype*: ♂ July 12, 1920, Cass County, North Dakota (A. A. Nichol); author's collection. *Allotype:* same data as the type. *Paratypes:* COLORADO—2 ♂ Aug. 3, 1894, Colorado Springs; ♂ June 5, 1894 Fort Collins (C. P. Gillette). 3 ♂ 1 ♀ August, Denver (N. Banks). ♂ July 22, 1900, Denver; ♂ July 13, ♀ July 16, 1900, Fort Collins (E. D. Ball). ♂, "Colo. Spr."; 3 ♂, "Colo. 1599, 1606." ♀ July 22, 1900, Pueblo. MINNESOTA—♂ ♀, Big Stone County; ♂ ♀, Traverse County (O. W. Oestlund). NEBRASKA—♂ Aug., 1903, Glen,

Sioux County (H. G. Barber.) MONTANA—♂ August 24, ♀ Aug. 21, 1892, Assiniboin. NORTH DAKOTA—4 ♂, taken with types. 4 ♂ 4 ♀ July 19, 1920, Devil's Lake. ♂ July 30, ♂ Aug. 4, 1920, Turtle Mountains (T. H. Hubbel). ♂ ♀ July 29, 1921, Edgeley. SOUTH DAKOTA—♂ ♀ June 16, 1891, Brookings (H. C. Severin). WYOMING—3 ♂, 2 ♀ July 20-25, 1920, Yellowstone National Park (A. A. Nichol). CANADA: BRITISH COLUMBIA—♂ June 9, 1905, Vernon. ♀ Aug. 15, 1919, Fort Fraser (W. B. Anderson). MANITOBA—♂, Winnipeg (A. W. Mitchener). ♀ July 22, 1910, Winnipeg (J. Cocks). SASKATCHEWAN—♂ ♀ July, 1922, Saskatoon (A. E. Cameron); reported as injurious to "small fruits."

**Lopidea falcicula** new species (Plate II, Fig. 6)

♂. Length 6.5 mm., width 2.3 mm. *Head*: width 1.11 mm., vertex .65 mm. *Antennae*: segment I, length .63 mm; II, 2.2 mm., cylindrical; III, 1.61 mm.; IV, .46 mm. *Pronotum*: width at base 1.8 mm. Color suggestive of *dakota* but the calli, scutellum and hemelytra with deeper black, and the pubescence on the dorsum finer and less conspicuous; genital claspers (fig. 6) distinctive.

♀. Length 6.8 mm., width 2.4 mm.; very similar to the male in form and coloration.

*Holotype*: ♂ August 2, 1900, Rico, Colorado (E. D. Ball); author's collection. *Allotype*: same data as type. *Paratypes*: ♂, topotypic. ♀ August 5, 1900, Antonio, Colorado.

**Lopidea fuscina** new species (Plate II, Fig. 5).

♂. Length 6.2 mm., width 2.14 mm. *Head:* width 1.22 mm., vertex .40 mm. *Antennae*: segment I, length .67 mm.; II, 2.16 mm., nearly cylindrical but perceptibly more slender near apex. *Pronotum:* width at base 1.86 mm. Form and color suggestive of *falcicula* but red areas of dorsum bearing yellowish pubescence; genital claspers (fig. 5) distinctive.

*Holotype*: ♂ June 6-8, 1907, Mount Diablo Range, Fresno County, California (J. C. Bradley); Cornell University collection.

**Lopidea taurula** new species (Plate II, Fig. 8).

♂. Length 5.9 mm., width 2 mm. *Head*: width 1.14 mm., vertex .68 mm. Genital claspers (fig. 8) indicate a close relationship with *taurina* but in this case the prongs of the right clasper scarcely form a half circle; dorsum clothed with short, black pubescent hairs, also more broadly red than in *taurina.*

*Holotype*: ♂ June 24, 1882, Umatilla, Oregon; author's collection.

**Lopidea nigridea** Uhler, Hemiptera Colorado, p. 30, 1895.

Distinguished by the genital claspers (Plate II, fig. 9), also by the chiefly fuscous coloration and the short, erect black hairs of the dorsum. The figure of the genital claspers here presented was drawn from one of the co-types (♂ July 16, 1894, Steamboat Springs, Colorado, C. F. Baker).

**Lopidea fallax** new species (Plate II, Fig. 10).

♂. Length 6 mm., width 2 mm. *Head*: width 1.14 mm., vertex .40 mm. *Antennae*: segment I, length .54 mm.; II, 1.97 mm., cylindrical. *Pronotum*: width at base 1.66 mm. Genital claspers (fig. 10) distinctive, although showing a close relationship with *nigridea;* differs from *nigridea* in the soft fine pubescence, nearly black hemelytra with reddish margins and the deep rose red pronotum with black calli.

*Holotype*: ♂ June 11, 1915, below Mountain Springs, San Diego County, California (Harold Morrison); author's collection. *Paratypes:* 2 ♂, taken with type. 3 ♂ June 11, 1915, Jacumba to Campo, San Diego County (Harold Morrison), and ♂ ♀, Los Angeles County, California.

**Lopidea serica** new species (Plate II, Fig. 12).

♂. Length 5.8 mm., width 2.24 mm. *Head*: width 1.23 mm., vertex .71 mm. *Antennae*: segment I, length .60 mm.; II, 2 mm., cylindrical; III, 1.16 mm.; IV, .46 mm. *Pronotum*: width at base 1.9 mm. Genital claspers (fig. 12) indicate a close relationship with *nigridea,* but *serica* differs in that the hemelytra bear in addition to black hairs, closely appressed, yellowish sericeous pubescence; hemelytra red, only slightly infuscated at commissure, scutellum nearly black, disk of calli with black spots.

♀. Length 5.7 mm., width 2.3 mm.; very similar to the male in form and coloration.

*Holotype*: ♂ June 28, 1900, Fort Collins (E. D. Ball); author's collection. *Allotype*: taken with type. *Paratypes*: 2 ♂, topotypic.

**Lopidea yakima** new species (Plate II, Fig. 11).

♂. Length 5.1 mm., width 2 mm. Closely related to *aculeata* but evidently differs in structure and color of the genital claspers (fig. 11). Dorsum bright red, calli and scutellum black, dorsum clothed with short black hairs and intermixed, at least on clavus, with closely appressed, sericeous yellowish pubescence.

*Holotype*: ♂ August, 1893, Olympia, Washington (Kinkaid); author's collection. Named after the Yakima Indians.

**Lopidea mohave** new species (Plate II, Fig. 14).

♂. Length 5.7 mm., width 2 mm. Related to *marginata* but differs in the genital claspers (fig. 14). Dorsum fusco-reddish, pronotum more fuscous than reddish, cuneus bright red; calli with margins black and spots on disk of each.

*Holotype*: ♂ July 25, 1907, San Antonio Canyon, Ontario, California; author's collection. Named after the Mohave Indians.

**Lopidea nicholi** new species (Plate II, Fig. 4).

♂. Length 5.8 mm., width 2 mm. *Head*: width 1.14 mm., vertex .64 mm. *Antennae*: segment I, length .60 mm.; II, mutilated. *Pronotum*: width at base 1.52 mm. Dorsum yellow as in *robiniae* but scutellum and each side of commissure not so distinctly black; dorsum clothed with short stiff, suberect black hair. Genital claspers (fig. 4) distinctive of the species.

*Holotype*: ♂ August 7, 1920, Columbia County, Washington (A. A. Nichol); author's collection.

**Lopidea ute** new species (Plate II, Fig. 19).

♂. Length 5.7 mm., width 1.7 mm. *Head*: width 1.14 mm., vertex .61 mm. *Antennae*: segment I, length .48 mm.; II, 1.86 mm., cylindrical; III, 1.26 mm. *Pronotum*: width at base 1.6 mm. Coloration suggestive of *navajo;* dorsum dark fusco-reddish, anterior margin of pronotum, embolium and outer margin of cuneus pale; clothed with very fine yellowish pubescence; genital claspers (fig. 19) distinctive of the species.

*Holotype*: ♂ July 15, 1894, Steamboat Springs, Colorado (C. F. Baker); Cornell University collection. *Paratypes*: 2 ♂, "Colo. 1330, 1341." Named after the Ute Indians, a tribe that inhabited the mountains of Colorado.

**Lopidea teton** new species (Plate II, Fig. 13).

♂. Length 6.3 mm., width 2.43 mm. *Head*: width 1.2 mm., vertex .68 mm. *Antennae*: segment 1, length .71 mm.;. II, 2.1 mm., nearly cylindrical, although perceptibly tapering smaller on apical half; III, 1.54 mm.; IV, .47 mm. *Pronotum*: length 1.26 mm., width at base 2.01 mm. Pubescence and color nearly as in *dakota* but the red coloration tinged with rose, disk of pronotum distinctly rose colored. Genital claspers (fig. 13) distinctive.

♀. Length 6.1 mm., width 2.36 mm.; very similar to the male in form and coloration. *Antennae*: segment II, length 1.86 mm. *Pronotum*: length 1.2 mm., width at base 2 mm.

*Holotype*: ♂ June 16, 1920, Norman County, Minnesota (A. A. Nichol); author's collection. *Allotype*: ♂ July 12, 1920, Cass County, North Dakota (A. A. Nichol). *Paratypes*: COLORADO—♂ ♀ June 6, ♀ July 17, 1900, Fort Collins (E. D. Ball); ♀ June 13, 1915, Morrison (E. C. Jackson). KANSAS —♂ May 29, Riley County; 2 ♀ May 30, Topeka (Popenoe). MINNESOTA—♀, Ottertail County (O. W. Oestlund); ♀ June 20, 1922, Norman County (A. A. Nichol), MONTANA—♂ June 18, 1911, Gallatin Valley. NEVADA—♂ April 20, 1915, alt. 6300 ft. Round Mountain (E. G. Holt). NORTH DAKOTA—♀, Dickenson (H. Osborn). SOUTH DAKOTA—2 ♀ June 16, ♂ June 21, Brookings; 2♂ 2♀ June 1, 1921, Capa (H. C. Severin). TEXAS—♀ April, 1914, Fort Worth (W. S. Adkins). Named after the Teton Indians, a name signifying "dwellers of the prairies."

**Lopidea bullata** new species (Plate II, Fig. 16).

♂. Length 4.6 mm., width 1.7 mm. *Head:* width 1.30 mm., vertex .80 mm. *Antennae*: segment I, length .34 mm.; II, 1.18 mm., slender, cylindrical; III, .86 mm.; IV, .37 mm. *Pronotum*: length .91 mm., width at base 1.51 mm. Closely related to *puella* but surface clothed only with soft yellowish pubescence, also the right clasper (fig. 16) without an erect, acute spine at dorsal angle, nor is the distal portion longitudinally furrowed. Pale to fuscous, head large, anterior margin of pronotum, scutellum, embolium and cuneus pale to white; membrane pale, veins and a ray behind smaller areole fuscous.

♀. Length 4.3 mm., width 2 mm.; embolar margins strongly arcuate; coloration similar to the male; membrane abbreviated, just attaining tip of abdomen.

*Holotype*: ♂, Los Angeles County, California; Cornell University collection. *Allotype*: same data as type. *Paratypes*: ♂ ♀, topotypic.

**Lopidea bullata fusca** new variety.

Genital claspers not differing appreciably from the typical species but with membrane and veins uniformly infuscated; scutellum and paler parts of head and pronotum reddish.

*Holotype*: ♂, Los Angeles County, California; Cornell University collection.

**Lopidea wileyi** new species (Plate II, Fig 17)

♂. Length 4.6 mm., width 1.6 mm. *Head*: width 1 mm., vertex .60 mm. *Antennae*: segment I, length .43 mm.; II, 1.5 mm., cylindrical;

III, .91 mm. *Pronotum:* width at base 1.36 mm. Black, hemelytra with a reddish tinge, pronotum red, calli blackish; clothed with fine short blackish pubescence; genital claspers (fig. 17) very distinctive of the species.

♀. Length 4.6 mm., width 1.6 mm.; very similar to the male in form and coloration.

*Holotype*: ♂ April 20, 1921, Eastland County, Texas (Grace O. Wiley); author's collection. *Allotype*: same data as the type. *Paratypes*: 2 ♂ 7 ♀, taken with the types. ♀ April 24, ♂ May 2, San Diego, Texas.

**Lopidea falcata** new species (Plate II, Fig. 18).

♂. Length 5.4 mm., width 2 mm. *Head:* width 1.14 mm., vertex .63 mm. *Antennae*: segment I, length .57 mm.; II, 2 mm., nearly cylindrical but tapering to slightly more slender apically. Black, lateral margins of pronotal disk behind calli, cuneus, embolium, base of clavus and outer half of corium red; dorsum clothed with fine yellowish pubescence; genital claspers (fig. 18) very distinctive of the species.

♀. Length 6.3 mm., width 2.2 mm.; larger than the male but very similar in form and coloration.

*Holotype*: ♂ July 12, 1915, Jemez Springs, New Mexico (J. Woodgate); author's collection. *Allotype*: same data as type. *Paratypes*: 2 ♂ 3 ♀, topotypic.

EXPLANATION OF PLATE II.

Male genital claspers of *Lopidea*

*a*, left clasper, dorsal aspect.
*b*, right clasper, dorsal aspect.
*c*, right clasper, posterior aspect.
*d*, left clasper, posterior aspect.
*e*, right clasper, internal lateral aspect.
*f*, right clasper, lateral aspect.

**The Mulford Biological Exploration of the Amazon Basin.**

Two accounts of some of the experiences of this expedition (on which some notes were published in the NEWS for 1922) have recently appeared. One is by the Director, Dr. H. H. Rusby: Report of Work on the Mulford Biological Exploration of 1921-22 (Journal, N. York Botan. Gard., xxiii, pp. 101-112), the other by Dr. O. E. White: Botanical Exploration in Bolivia (Brooklyn Botan. Garden Record, xi, pp. 931 et seq.)

# Notes on the Biology of Two Species of Stenopelmatus (Orth.: Tettigoniidae).

By Carl D. Duncan, Stanford University, California.

Very little is known concerning the lives of these singular insects, references in consequence being few and generally vague, most authors having dismissed the subject with a statement to the effect that *Stenopelmatus* is supposed to feed on decaying or dead animal or vegetable matter. On the other hand, Essig[1], says, "However, we do know that they are often responsible for considerable injury to potatoes before they are dug. The tubers are gnawed so as to be unfit for keeping or selling. Occasionally a large proportion of the crop may thus be injured but this is more likely to occur in small newly cleared areas." The following observations therefore, though made on insects in the laboratory, and not at all extensive, have the value of definiteness, which may justify their publication.

**Stenopelmatus longispina** Brunner.

On March 5, 1921, a large female was collected from under a stone near Cooley's Landing on San Francisco Bay, near Palo Alto, and brought into the laboratory. Here it was put into a small wire screen cage with about an inch of damp sand in the bottom. A card-board box cover, open at one end, was placed on the sand to give shelter to the insect should it choose to remain above ground.

The specimen was kept from March 5 to March 24. On the latter date it was found dead, the cause of death not being apparent. Dissection showed the specimen to be a fully adult female, the abdomen containing twelve apparently fully formed eggs and many others in various stages of development. The mature eggs were of a regularly elliptic form, measuring two mm. by four mm., and were of a lemon-yellow color.

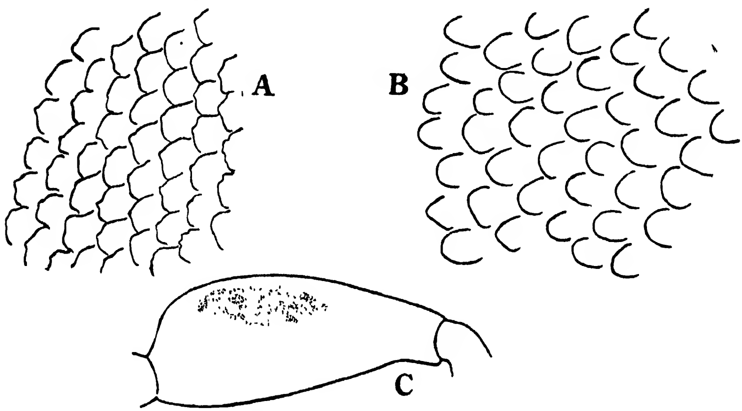
The insect burrowed into the sand during the day, where it remained quiet unless disturbed. At night it came out and crawled actively about the cage climbing all over the sides. When the sand became dry through neglect, or very wet when too much water was put in, *Stenopelmatus* stayed above ground and used the card-board shelter.

---

[1] Essig, E. O. Injurious and Beneficial Insects of California, p. 37-8.

For several days I kept a petri dish of water in the cage, but I failed to observe the captive drink, although I frequently watched it at night at varying hours up to 2.30 A. M.

About thirty-six hours after having collected the specimen, it having passed the intervening time in a small bottle, I placed it on a laboratory table and began teasing it with a pair of forceps. It exhibited the usual defensive and belligerent attitudes characteristic of the genus and in addition, to my surprise, began stridulating. The sound produced was quite similar to




*Stenopelmatus longispina* Brunner: A, portion of rasp of male; B, portion of rasp of female; C, inner surface of hind femur of male, showing stridulatory rasp.

that made by rubbing two pieces of rough paper together and was made by rubbing an elongated, roughened area on the upper edge of the inner surface of the hind femur (Fig. C) against the short spines which are scattered over the sclerites and connectiva of the side of the abdomen. An examination of several specimens in the University collection showed both sexes to possess the stridulating apparatus.

The mechanics of the stridulation vary. When first noted the insect pressed the femora against the sides of the abdomen and the latter was then jerked upward and slightly forward from one to several times. Later on the insect stridulated when walking away from me and at such times the legs furnished practically all the movement. Stridulation is not

naturally incident to walking, however, as the insect at times walked quite noiselessly. Again, quoting from my notes, "When touched on its back or cerci it kicks one or both of its hind legs high in the air over its back, rubbing its femora against the abdomen in doing so."

The function of the stridulation, as indicated by this specimen, seems to be defensive and intimidatory. For example, "I drop an angleworm in front of 'Steno.' At the squirming of the worm 'Steno' draws back quickly and stridulates twice. I put two *Batrachoseps* (a small salamander) into the cage, dropping one alongside 'Steno,' who promptly stridulated. She stridulated again when I pecked the sand behind and slightly to one side of her with my forceps."

The only food that I succeeded in getting the insect to eat was animal. It refused to eat bits of apple or potato or the berries of *Eugenia* sp., even when not supplied with any other food for two or three days. It ate a number of freshly killed Cerambycid larvae and several large termites which were placed in the cage in a petri dish. So far as observed it fed only at night. When feeding, the click of its mandibles was audible for at least four feet from the cage. An angle-worm which I put alive into the cage was apparently eaten for it disappeared. However, the angle-worm may have escaped from the cage through a hole in one corner, although this seems impossible as the hole was fully one and one-half inches above the sand and it seems unlikely that an angle-worm would forsake an attractive home of wet sand to crawl about a dry metal cage.

A small salamander, *Batrachoseps attenuatus*, about four and a half inches long, which I put into the cage, and which burrowed immediately into the sand, disappeared during the course of four days. I later found what appeared to be the tail of the salamander in the cage. However, I should not like to say that the *Stenopelmatus* killed and ate the salamander as it could easily have climbed out of the cage through the hole mentioned before. Nevertheless, the belligerence and strength of the *Stenopelmatus* which would make the *Batrachoseps* an easy prey should it be chosen for such a fate at

least makes it seem not impossible that the salamander met its death at the "hands" of the former.

Decaying animal matter, such as Cerambycid larvae, crickets, crane fly larvae and two dead ring-necked snakes were untouched by the *Stenopelmatus* although they were left in the cage for several days. No food of any sort was eaten during the four days preceding the insect's death.

**Stenopelmatus pictus** Scudder.

On October 22, 1921, a male of this species was found near Stanford University under a pile of garbage which had been exposed to the weather for several months and was nearly dried out. It bore the empty shells of thirty-eight elliptic, white eggs of a Dipterous parasite, of which seven were on the legs, five on the thorax and twenty-six on the abdomen. The *Stenopelmatus* did not seem to be in the least incommoded by the eggs or the larvae which had hatched from them and were even then living within its body.

I kept the specimen in a large jar, without any sand or earth. It received no food until October 27, when at 7.30 P. M., I put in a small grass-hopper, *Melanoplus* sp., of which I pinched the head and removed the hind legs in order to render it less lively. At 8.10 P. M., the *Stenopelmatus* began feeding on the grass-hopper and continued to do so until only the detached hind legs, a few eggs that I had squeezed out of it in killing it, and a piece of the pronotum remained. The chitinous parts were chewed and swallowed along with the rest. The click of the *Stenopelmatus'* mandibles was distinctly audible as it fed.

After feeding ceased I began teasing the insect. Continued teasing for several minutes failed to elicit stridulation. An examination of the specimen, however, revealed the same stridulatory mechanism as that possessed by *S. longispina.* I repeatedly turned it on its back with my forceps or caught and held it by one leg. In answer to the former it usually merely righted itself and tried running away again. To all appearances it ran in any direction which proved convenient, as frequently toward my threatening forceps as away from them. When held by one leg it turned and used its other legs

and its mandibles in attempts to free itself. When picked up by the thorax it would use all six legs in an attempt to get free. After considerable teasing it lost its good nature and began to show resentment, running away less. When approached by the forceps it would rear up its body in a defensive attitude, lifting its middle and fore legs on the side next the forceps. It would defend itself with great vigor, biting and scraping the forceps. No stridulation whatever took place.

On October 28 I placed a cricket in the jar. The *Stenopelmatus* followed it about, making several unsuccessful attempts to capture it. From what happened it was not apparent whether the *Stenopelmatus* were actually hostile or merely manifesting curiosity. Both insects shortly became quiet on opposite sides of the jar and remained so until 12.30 P. M. of the next day, at which time I put in a grass-hopper, *Melanoplus* sp. The grass-hopper jumped about excitedly, much to the discomfort of the *Stenopelmatus* and the cricket. After several attempts the former caught the grass-hopper and chewed a big hole in the venter of its thorax. Then it left the grass-hopper practically dead and with legs twitching.

At 8 P. M. the hole in the grass-hopper's thorax was much larger. I put in a live fly, *Calliphora erythrocephala*.

On October 30 at 2.30 P. M. the cricket was dead and the fly apparently killed and eaten, since it had disappeared.

On October 31 the *Stenopelmatus* killed but did not eat another *Calliphora*. A third was left unmolested.

On November 3 the *Stenopelmatus* died.

On November 7, A. M., parasitic larvae began to emerge. They all emerged within twenty-four hours, making their exit from the host through a slit in the dorsum of the abdomen between segments two and three. In all seventeen larvae emerged. They showed considerable variation in size.

A few days later the mature flies emerged. These were determined by Mr. F. R. Cole as *Plagioprospherysa parvipalpis* Van der Wulp.

The species of *Stenopelmatus* were determined by the author with the aid of Hebard's paper on the genus [2].

[2] Hebard, M. Jn. N. Y. Ent. Soc. 24: 70-86. 1916.

# Observations on the Behavior of Spiders; the Safety of Spiders from becoming Entangled in their own Webs (Aran.).

By RICHARD M. BRICKNER, College of Physicians and Surgeons, New York City.

It was the belief of Fabre[1], substantiated by a single set of experiments, that the spider secreted some sort of fatty fluid, soluble in carbon disulphide, which protected the legs of the animal from becoming stuck to the sticky parts of its web.

The following observations were carried out on the basis of this view. Large orb spiders, strong and very vigorous, were held by one leg, while several of their other legs were bathed in carbon disulphide. Opportunity was given for the surplus carbon disulphide to evaporate, and the spiders were then dropped on to the floor of large funnel or orb webs. In making its first attempt to walk the spider became completely entangled. A series of controls was run simultaneously, and the following results were obtained in every case: Controls: normal spiders were able to move about with ease in any web in which they were placed. Experiments: spiders whose legs had been bathed with carbon disulphide were unable to manouvre properly in any web, because their legs became adherent to the silky strands. Technique: the animal was held in the left hand, by six or seven legs. The remaining leg or legs were allowed to lie upon the tips of the fingers. Carbon disulphide was allowed to drop from a pipette, upon these free legs. In most cases the remaining legs were freed, one by one, and similarly bathed. The legs were allowed to become perfectly dry. Care had to be exercised not to touch any portion of the animal's body with carbon disulphide except the legs; otherwise instant death followed.

The fact being that a bath of carbon disulphide causes the legs of the animal to stick to the silk of a web, the following possibilities obtain in explanation: 1. The globules of carbon disulphide themselves serve as a glue. 2. The carbon disulphide causes paralysis of the leg muscles. 3. There is a pro-

[1]Life of the Spider, page 274.

tective fluid, which is dissolved away by the carbon disulphide (Fabre's hypothesis). 4. The dust, etc., upon the leg becomes condensed among the setae.

Possibility No. 1 is disposed of at once, because the leg was always allowed to become perfectly dry before the experiment proper was commenced, and there was not the least possibility of any of the very volatile bathing fluids remaining upon the animal's limb. The possibility of paralysis is raised by the following facts: in every case in which merely the two forelegs had been wet with carbon disulphide, the spider, in quitting the floor of the strange web, kept these wet legs raised aloft, and would not allow them to touch the silk at all. This was observed even with hind legs which had been bathed alone. In some instances the bathed legs were dragged after the spider, behind, motionless and more or less stiffly. This peculiar attitude may have been due to paralysis, or simply to an effort at protection, on the part of the subject. That the former contention is incorrect is definitely proved by the vigorous motion of all the subjects, after removal from the trap web, and particularly by the following instance: The bathed subject was placed on the floor of a tunnel web. Instead of essaying to escape it stretched itself out at full length, with legs extended and lying together, four toward the head and four toward the tail—as the same variety of spider frequently does in its own web, or under a leaf, in the presence of large enemies, like a human hand. No amount of poking would make this animal budge. Thinking it possible that it might be dead, I picked it up in my hand. In a few seconds the limp spider suddenly sprang to its feet and rushed away. This specimen repeated its performance twice, but finally attempted to walk off the delicate floor of its own web, in which I had subsequently placed it, and succeeded only in shattering the structure, and in carrying a good deal of the substance off on its feet.

The hypothesis of Fabre, that the sticking is due to the solution of some organic, secreted protective fluid, has no direct proof. It is rather a broad jump to assume that the particular fluid which the spider is supposed to secrete happens to be soluble in carbon disulphide.

The damage done to the spider's leg is temporary, and seems to be repaired by a process of combing, which the animal performs after its bath, and which is described in the following paragraph.

It is possible and even necessary to assume, with the protective fluid theory, that this act, which invariably restores to the spider its facility and without which the facility does not seem to return, replenishes the supply of fluid to the legs from which it has been dissolved. While there is no proof that this does not occur, repeated observations of the process under the binocular have failed to exhibit the presence of any droplets, such as might be expected, upon the freshly combed legs, and the following observation furnished conclusive proof that the operation accomplishes (perhaps among other things) a cleansing of the combed leg. I observed a single combing, which went on in the palm of my hand, with a lens. First the legs were carefully drawn between the chelicerae, several times. The pedipalpi were then inserted between the chelicerae and were used as brushes. The pedipalpi were soon withdrawn from the chelicerae, covered with dirt, which they had evidently brushed from the latter. The spider now rubbed its pedipalpi together and rolled up a little pill of dirt which it discarded. This fascinating act was repeated.

Inasmuch as it is an easily perceived fact that the dust, etc., on the spider's leg, is quite condensed among the setae, and that the setae themselves are matted down, and more or less adherent to the shaft of the leg, after the carbon disulphide bath, it is very probable that this matting and condensing are the factors which do away with the free play of such a leg. In fact, it seems rather far-fetched and unnecessary to seek any further for an explanation.

The following further observation is the only positive indication against the fluid theory. The body of a spider which had been dead about 43 hours was examined, and found to be so dry that the legs had to be handled with care to prevent their breaking off. It is a fair assumption that no film of protective fluid could have been left on the legs or body of this animal, and

yet the legs showed as great an immunity as ever, when touched to, or rubbed against, a sticky thread.

We now have a method of causing the temporary loss of the animal's immunity. Wherein, then, lies the actual facility of the normal animal? If we do not seek some fluid as the source of it, another protective agency must be found, and the first place to look for it is in the structure of the animal's body itself.

The following experiments, repeated a number of times, furnished final proof that no part of the body of a spider will adhere tightly to a web, if merely placed in contact with some sticky part of it. A medium-sized zigzag spider was chosen. The common observation of the journey of the animal across the sticky areas of its web was made and it was found that the glue upon the strands offered no impediment whatsoever. Firm grasp of a leg was taken, and the structure was rubbed vertically along a strand. Very slight sticking occurred. Rubbing of the leg horizontally along the strand was thereupon performed, and the same immunity was observed. This experiment was repeated with numerous specimens with unchanging results. The abdomen of the spider was then held against sticky threads in every conceivable position. Again, only very slight adherence occurred. The tip of the abdomen was introduced between three parallel and consecutive sticky threads. When the body was drawn away from the web, the three threads followed it a little way, but they were invariably released and sprang back to their original positions. All parts of the abdomen were thus found to be equally non-adhesive, under a control series. When the same manouvre was attempted with a blade of grass, and with a small straw, the threads were never able to spring back to their original parallelism, because of an attachment formed with the instrument. In all cases, the three threads were pulled much farther out from their supporting radii than had been the case when the various parts of the spider's body had been the pulling apparatus. In every instance, in the control set, at least one thread broke.

Referring again to the dried body of the spider which had

been dead 43 hours, it should be mentioned that the abdomen, as well as the legs showed normal immunity.

The legs and bodies of some demoiselles, and of several other smooth-winged insects, were now tried; and, surprisingly enough, were found to be as slightly adherent as the similar parts of the spider. The legs of a grasshopper were drawn across the sticky strings like the bow of a violin; its passage was entirely unimpeded. If the body of the spider contains no safeguard which is greater than that of the insects which it makes its prey, why is the home in which the spider lives in ease and comfort a death trap for flies and grasshoppers?

It is possible that the spider is possessed of an instinct which enables it to take care of itself in a web, whereas the insects which are unfortunate enough to tumble into a spider's web are not so blessed, and soon find themselves lost. The obvious hypothesis is that it is the entanglement in which the ordinary insect involves itself which causes that animal to be completely entrapped, and hopelessly entangled in the end.

It might be surmised then that even a spider, thrown violently into a web, might find itself in difficulties. Such is exactly the case. A large zigzag spider was selected and was pitched, with some violence, into a web of a larger specimen. It struggled and soon became completely entangled. The spider had sufficient strength so that a thread lying across its back caused it no trouble, but it did not have strength enough to pull any one leg out of its silk sheath, until all the others were free, except with the most extreme difficulty. I, however, was able to draw any leg out of its wrapping with ease; the silk peeled off. The observation was repeated a number of times. The spider was found to possess no particular facility except when in the standing position. When thrown into a web the first effort was always to achieve the standing position, and to present the least possible body surface to the sticky strands. This is accomplished, of course, by resting on the individual strands upon the claws, and by clutching the strands with these claws. It will be observed that this position is the one used by the spider when it is traveling across the sticky part of its web; as well as when it is resting in the central, non-sticky portion of it, and also

that the spider actually handles the sticky lime silk, when the web is being built, by clutching it between its claws.

It would seem that darning needles, grasshoppers, etc., which are accustomed to being caught and involved, when they strike webs, could save themselves, if they eliminated their wild struggles, and, instead of slapping at the trap with their wings, should fold up the latter and devote themselves to aping the spider by acquiring the position of standing quietly upon their points of least body surface, namely, their feet.

A damsel fly's wings were cut off short; the fly had no trouble at all in dropping out of the web, provided only that it was placed there on its feet. Occasionally the long abdomen became entangled and had to be freed by hand. In freeing itself, the clipped damsel fly did not drop off of the web at once, but clung to it with her claws. Upon my attempting to liberate her from her entanglement, the shackles slid off easily enough, but the animal subsequently clung to them with her own claws. Repeated observations of this character were convincing that the bewilderment and lack of the proper instinct, as well as the massive bodily projections, such as wings, or long abdomens which singly were not very adhesive, but which, together, could become very much entangled, are what contribute most largely to the fatal entanglement of most of a spider's prey; and that the particular factor which bestows upon the tenant of the web its own dexterity in getting about, is a body which is so constructed that the animal is not burdened by ponderous projecting parts; and, second, an instinct by which the spider remains in, or immediately achieves, the standing position when in, or placed in, a web.

It must not be forgotten that a spider builds a web for its own individual use, and that it cannot help placing the succeeding strands just so far apart from each other that the distance is best fitted to be covered by legs which are of the exact size of those possessed by that particular spider. The grasshopper which strikes the web is not built for such a home; its comparatively massive body occupies too much space, covers too many sticky threads. One or two moves, and the grasshopper has wrapped itself in a fatal sheath. The poor ant which finds

itself upon a web is usually in an equally embarrassing position. Even if it were possessed of the spider's instinct, it could not reach; it is too small, one strand is often all it can touch, and it can do little but haul its poor body slowly along that sticky strand.

Regarding the generic and specific names of the spiders, I am, unfortunately, not able to be as precise as I desire to be. The spiders were not identified properly at the time the experiments were done, because of the interference of certain circumstances, and the saved specimens were lost. I have spent considerable time in examining the spider collection at the Museum of Natural History; this work leads to the probable identification of the "orb" spider I used as *Tetragantha extensa,* and of the "zigzag" spider as *Miranda aurantia.* The fallibility of this second-hand method of identification, however, makes it impossible to be certain of the results.

## A New Species of Agrilus (Buprestidae, Col.).

By A. B. Champlain and J. N. Knull, Bureau of Plant Industry, Harrisburg, Pennsylvania.

A collection of *Agrilus* belonging to the University of Minnesota was submitted to the authors for determination, through Prof. J. G. Sanders, Director of the Pennsylvania Bureau of Plant Industry. In identifying the material one species was found which did not agree with any of the described members of the genus, and though the kindness of Prof. H. H. Knight, the authors were permitted to describe it.

**Agrilus egeniformis** n. sp.

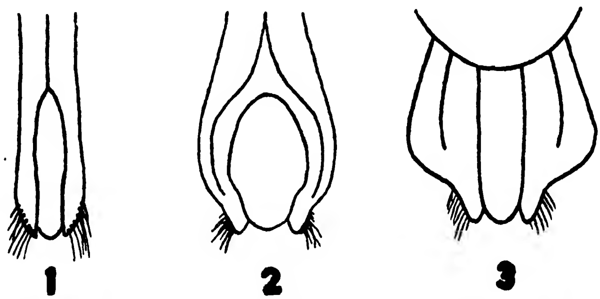
Olive bronze, more shining below than above. Antennae reaching the hind angles of the prothorax in the male, serrate from the fifth joint. Vertex of head with a feeble median impression. Prothorax wider than long, sides arcuate, hind angles rectangular with an oblique carina, lateral margin deflexed in front, disk convex with two rather shallow median impressions, lateral oblique depression prominent, surface lightly transversely strigose. Scutellum transversely carinate, surface granular. Elytra with sides sinuate near base, dilate behind middle, apices rounded and serrulate, surface imbricate, each elytron with three pubescent spots, one at base, one in front of middle and one back

of middle. Prosternal lobe truncate, slightly emarginate. Abdomen sparsely punctate, pygidium carinate, carina not prolonged, tarsal claws broadly toothed at base. Length 4.5 mm.

♂.—Front more shining. A dense line of pubescence extending from prosternum to end of second ventral segment. First and second ventral segments of the abdomen impressed at middle.

♀.—Prosternum not pubescent, ventral segments of the abdomen not impressed at middle.

Superficially this species resembles *A. fallax* Say, but can readily be separated from this species by the serrate fifth antennal joint. According to Horn's key this species would run to *A. egenus* Gory, but it is distinct from this species and *A. celti* Knull by the marked pubescent patches of the elytra and by the structure of the male genitalia.




Outline drawings of the male genitalia of the following species of *Agrilus*: 1. *A. celti* Knull; 2. *A. egenus* Gory; 3. *A. egeniformis* n. sp.

Although the adults of *A. egenus* Gory, *A. celti* Knull and *A. egeniformis* n. sp. approach each other in general appearance, the genitalia of the males show striking differences which are best shown by the accompanying outline drawings.

Described from a series labeled "Mo." in the collection of the University of Minnesota, and from one specimen labeled "Lawton, Oklahoma," collected by G. W. Barber, and two specimens labeled "West Pt., Nebraska, June," in the collection of C. A. Frost. The authors are indebted to Mr. Frost for the loan of his material. *Type* labeled "Mo." in the authors' collection.

*G. H. Horn—Trans. Amer. Ent. Soc., Vol. 18, p. 277-336, 1891.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., MARCH, 1923.

### A Possible Service to Entomologists.

It has been suggested that the NEWS might do a service to working entomologists, especially those who have not access to large libraries or to the rarer entomological books and papers, by occasionally reprinting brief articles which never enjoyed a large circulation. Such are some of the specific descriptions of Thomas Say, S. S. Haldeman and others. Perhaps to reproduce these in the NEWS would be a real help to students. Under present costs of publication, the NEWS could not increase its pagination to include such reprintings, nor would it be fair to greatly delay the appearance of new work by taking more than a few pages per year for this purpose. We shall be glad to receive expressions of opinion on this proposal from our readers, as well as the titles of papers desirable to be reprinted, should this idea be carried into execution.

### Oxycnemus histrina on Fungus (Col.: Nitidulidae).

Mr. Charles Leng has advised me to publish a record capture of a beetle found on the mushroom (*Phallus impudicus*-Stink Horn Fungus) which I collected at Mulhall Station, Virginia (near Washington) on September 23. I wrote to Mr. Leng after consulting Dr. E. A. Schwarz and Mr. Barbour of the National Museum in regard to the advisability of recording this capture and the three seem to agree that it is quite unusual. The beetle in question is the Nitidulid beetle—*Oxycnemus histrina*. In collecting this beetle, I came across one single mushroom and found it in a very decayed state. In the mushroom itself, or better yet in the partial remains of the mushroom, I took the astounding number of 38 specimens and had I wished to exterminate the colony, very likely could have taken at least 75-100 more. All three of the gentlemen whom I consulted agreed that this is by far a record. Dr. Schwarz had never captured more than 3 on a single plant and Leng had taken but 5 and both agreed that in most cases not more than one specimen was to be found on a single plant. Blatchley says in his "Coleoptera Known to Occur in Indiana" that only one or two specimens have ever been found on a single plant.

I should be pleased to hear further from collectors on this question. It may be that I am mistaken in calling my case a record one.

MORTIMER L. J. HIGGINS, 1303 P St. Northwest, Washington, D. C.

# Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

**A Supplementary Note on Gomphus dilatatus (Odon.: Aeshnidae).**

Mr. Philip Laurent, to whom I owe so much interesting Odonate material, has given me a male *Gomphus dilatatus* Rambur, taken by himself at Gunntown, Levy County, Florida, March 1-15, 1922. Its capture was, consequently, subsequent to the publication of my recent paper[1] on this species and its allies. This male is the seventh of its sex known to me.[2] A comparison of it with such of my previous material as is now available, viz.: the male from Suwanee Springs (?), Florida, from which figs. 14, 15, 17 and 21 of my Plate XV were drawn and the fragments from Amite River, Louisiana, shows some interesting facts. When I drew my figure 21, I believed, from comparisons with *lineatifrons* and *vastus,* that the terminal filaments of the penis of *dilatatus* were in reality as long as they are represented in my figures 22 and 23 for *lineatifrons* and *vastus* respectively, and I therefore indicated them as broken, showing a part of their supposed length by dotted lines. On relaxing the new Gunntown male, I carefully extruded the penis, experiencing no difficulty in the operation, and then found that it and the Suwanee (?) and the Amite River males agree in possessing *short* terminal filaments to the penis. Their actual length would be expressed by retaining only the first two pairs of dots for each filament in my figure 21 and expunging the others. Each filament in all three males terminates in a very acute point, very much more slender than the filaments of *lineatifrons* and *vastus* at the same distance from their bases.

This difference in the length of these filaments will thus constitute another structural character in the male of *dilatatus vs. lineatifrons* and *vastus.*

I also note that the Gunntown male has the tooth of the second penis joint (*tp* of my figure 23) not as attenuate as apex, nor with the slight ante-apical process, as shown in my figure 21, but is more as in figure 22. The same statements are probably true for the Amite River male although this tooth has been damaged.

The posterior margin of the vesicle of the penis, fully extended, of the Gunntown male, measures 1.406 mm., which is .345 of the height of the hind margin of abdominal segment 2. Corresponding figures for a second male (paratype) of *G. lineatifrons* from the Tippecanoe River, Indiana, are 1.48 mm. and .4 (*cf.* character 18, Trans. cited, p. 224).

[1]Trans. Amer. Ent. Soc. xlvii, pp. 221-232, pls. xiv,xv. Dec. 27, 1921.

[2]In addition to the five mentioned in my paper, *l. c.*, pp. 225, 230, I believe that there is still another in Mrs. A. T. Slosson's collection.

Mr. Herbert Campion, of the British Museum of Natural History, wrote me under date of August 21, 1922: "I have examined John Abbot's coloured drawing (No. 14)[3] of *Gomphus dilatatus* with your remarks on the species before me As regards the coloration of abdominal segment 8, which is the subject of comment in your paper, there is no indication of any middorsal line, but there is an anterolateral yellow spot on each side, which, on the right side, at all events, is continued backwards as a rather broad band to the posterior margin of the segment. Segments 7 and 9 also have lateral yellow markings. The thoracic pattern agrees very well with your fig. 13, except that posteriorly, the junction between 1*a* and 2*a* is rounded, and not straight, as shown by you."

PHILIP P. CALVERT.

---

**Leucorhinia proxima at a High Altitude in Colorado (Odon.: Libellulidae).**

Prof. T. D. A. Cockerell recently presented to the collection of the Academy of Natural Sciences of Philadelphia a male of this species taken at Ward, Colorado, at a swamp, on July 1, 1922, by B. Hill. Prof. Cockerell wrote: "Ward is 9230 feet altitude and so far as I can find this is by far the highest altitude for the genus. Tillyard remarks (Biol. Dragonflies, p. 315) on absence of Libellulinae at high altitudes, so the record ought to be published."

In this connection we may recall the occurrence of *Sympetrum corruptum*, of the same subfamily, at 11,000 and 13,000 ft. in Colorado (Ent. News, xxvi, p. 119). PHILIP P. CALVERT.

---

**Insects Taken at Hot Springs, Rotorua, New Zealand.**

The past summer it was my good fortune to be associated with the University of Iowa expedition to the Fiji Islands and New Zealand in the capacity of entomologist and ornithologist. During the course of my stay in New Zealand a side trip to the Rotorua district was made and some collecting was indulged in there. The hot springs, so alluring to all, were visited and some of the entomological findings are here recorded briefly.

The center of the so-called thermal district in New Zealand is in the North Island at Rotorua, which has a population, exclusive of the tourists, of about 2000. Rotorua is about 170 miles southeast of Auckland, 800 feet above sea level and has been the scene of a great amount of volcanic and thermal activity, the sulphurous fumes and streets of volcanic ash constantly reminding one of these occurrences. Owing

---

[3] *Cf.* Hagen, Stet. Ent. Zeit. xxiv, p. 373, 1863; Proc. Bost. Soc. Nat. Hist. xvi, p. 359, 1874.

to the fact that the waters of the region possess certain curative properties, many hotels and bath houses are maintained for the accommodation of the public. Several of these are under government supervision.

At the north edge of the town, immediately facing Lake Rotorua, is a native Maori village known as Ohinemutu and it was along the lake shores in front of this village that the observations recorded below were made. Here, hot or boiling water issues from the sandy ground in the form of miniature geysers the water from them uniting shortly to form numerous small pools and streams which ultimately flow into Lake Rotorua. Some of these streams are as much as six inches in depth while others are only one or two inches deep.

Certain insects seem to be attracted by the heated earth in the vicinity of the bubbling hot water, the heat being great enough to be felt through the soles of heavy collecting shoes as one walks over it. If the insects on the sand are disturbed some jump or fall into the hot water and are killed. A good many were thus taken from the shallow streams as they were being carried to the lake a few yards away. Covering the margins and bottoms of most of the streams and pools, is a slimy dark green vegetable growth of varying thickness, which serves as food for some kinds of insects and gives an added incentive for them to visit the region.

On July 27 and again on July 31 several species of flies (Diptera) were found in this situation; one, a small blackish form was very abundant on the warm sand. Another large, black, active species fed greedily on the algae growing in the hot water and along its edge. In some instances the flies rested on the surface of the water while feeding, but if accidentally immersed in it they quickly succumbed, thus indicating that they are not totally immune to the effects of the hot water. A species of crane fly was also found feeding on the algae growing on the hot sand.

Of Hemiptera, two species were taken; one, a small blackish heteropteran in both nymphal and adult stages, was found on the algae around the hot springs, while small water striders glibly glided over the surface apparently suffering no inconvenience from the heated supporting medium.

In the water a species of small hydrophilid beetle (Coleoptera) as well as its larva was taken and here, too, fly larvae were found breeding.

At least five species of insects representing three different and distinct orders were taken in, on or in the immediate vicinity of the hot springs. In the case of those insects which breed in the water some interesting items of ecological significance are suggested. Apparently abundant food and a considerable freedom from enemies is afforded. A constant temperature is maintained throughout the year so that the need for a definite breeding season is eliminated although the climatic

conditions of winter and summer are well marked. It would be interesting to know to what degree, if any, these insects have changed their nature by long and continued residence in the hot water.—DAYTON STONER, University of Iowa, Iowa City, Iowa.

---

### Entomologische Mitteilungen.

Dr. Walther Horn, of the Deutsches Entomologisches Museum, Berlin-Dahlem, Gossler-Str. 20, Germany, writes that his Museum lacks financial support and is hardly able to continue its existence. The publication which he issues, namely *Entomologische Mitteilungen,* is critically feeling the financial conditions of Germany, and especially the monetary exchange. Prices of printing have risen enormously, and hopes for the future are very dim. On account of the condition of the exchange, subscriptions to the journal when sent in German marks are not welcome, because of the constant and extremely rapid decline in value of the mark. Doctor Horn wishes that American subscribers to the journal should send their subscription price ($1.25) in American money; and if this is done, and if more subscriptions are sent in, he hopes that the journal may be able to continue.

L. O. HOWARD.

---

### An Interesting New Case of Phoresie (Heterop.: Coreidae; Hymen.: Proctotrypidae).

*Anoplocnemis curvipes* is a Coreid which is very injurious to vegetable crops, especially legumes, in the Belgian Congo. Lieut. Jean Ghesquière, Entomologist to the Belgian Congo, in a brief note in the Bulletin of Agriculture of the Belgian Congo for 1921, of which he has just sent me an author's extra, described the habits of an egg-parasite of this bug, and they are extremely interesting. The parasite is not identified, but is referred to as a Proctotrypid. From the illustration, it would seem to be a *Telenomus*, or at least a Telenomine. Lieutenant Ghesquière states that the parasite flies around over the plants which are actively visited by the bug, and when a female parasite gets the chance she jumps upon the pronotum or the top of the head of the bug. She tries to find females especially, but, failing the females, she will jump on the head of a male; never, however, will she mount larvae or nymphs of the bug. If she finds herself on the head or back of a male, at the moment when the bugs couple she passes to the female. The egg-laying of the *Anoplocnemis* takes place a few minutes after coupling, and the parasite then leaves the adult bug, but lays its eggs in the eggs which are laid. After egg-laying is completed, she resumes her earlier position on the head of the female host.—L. O. HOWARD, U. S. Bureau of Entomology, Washington, D. C.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of The American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **13**—Journal of Entomology and Zoology, Claremont, Cal. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **20**—Bulletin de la Societe Entomologique de France, Paris. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **39**—The Florida Entomologist, Gainesville, Florida. **50**—Proceedings of the United States National Museum. **52**—Zoologischer Anzeiger, Leipzig. **64**—Parasitology, London. **67**—Le Naturaliste Canadien, Quebec. **68**—Science, Garrison on the Hudson, N. Y. **76**—Nature, London. **82**—The Ohio Journal of Science, Columbus, Ohio. **85**—The Journal of Experimental Zoology, Philadelphia. **88**—Occasional Papers of the Museum of Zoology, University of Michigan, Ann Arbor. **91**—The Scientific Monthly, Lancaster, Pa. **92**—Archives de Zoologie Experimentale et Generale, Paris. **95**—Annales des Sciences Naturelles, Paris, Zoologie. **98**—Annals of Tropical Medicine and Parasitology, Liverpool. **111**—Archiv fur Naturgeschichte, Berlin. **115**—Societas Entomologica, Stuttgart.

**GENERAL.** **Essig, E. O.**—Insect notes from Laguna Beach, Cal. **13,** xiv, 75-8. **Hartman, C.**—Swarming insects simulating smoke. **68,** lvii, 149-50. **Latour, B.**—Insectes d'autrefois. **67,** xlix, 127-31. **Martin & McKittrich.**—A key for the identification of animal parasites found in the human feces. (Bul. Univ. Wisconsin, iv, 371-94, 1917). **Muller, G. W.**—Insektenlarven an wurzeln von wasserplanzen. (Mitt. Naturw. Ver. Neuvorpom. u. Rugen in Greifswald, Berlin, xlviii, 30-47). **Robson, G. C.**—A note on the species as a gene-complex. **11,** xi, 111-15. **Sharp, David**—Obituary note of **10,** xxiv, 207. **Stiles, C. W.**—Zoological nomenclature: Musca and Cal-

liphora. **76**, cxi, 115. **Wheeler, W. M.**—Social life among the insects. VI. The termites or "white ants." **91**, xvi, 160-77 (cont.)

**ANATOMY, PHYSIOLOGY, ETC.** **Burge, W. E.**—A comparison of the catalase content of luminous and non-luminous insects. (Abs-Bul. Nela Res. Lab. Gen. Elect. Co., Cleveland, Ohio, i, 448-9.) **Dehorne, A.**—Determination du nombre des chromosomes dans les larves de Corethra plumicornis. **92**, lviii, 25-30. **Janet, C.**—Considerations sur l'etre vivant. Pt. 2, L'individu la sexualite, la parthenogenese et la mort, au poit de vue orthobiontique. Beauvais, 1921, 196pp. **Kopec, S.**—The influence of the system on the development and regeneration of muscles and integument in insects. **85**, xxxvii, 15-25.

**THE SMALLER ORDERS OF INSECTA.** **McDunnough, J.**—Notes on Canadian dragonflies for the season 1922. **4**, liv, 255-7. **Nakahara, W.**—Notes on the feeding habits of scorpion-flies. **5**, xxix, 212-13

**Needham & Claassen.**—The N. Am. species of the genus Acroneuria. **4**, liv, 249-55. **Watson, J. R.**—On a collection of Thysanoptera from Rabun Co., Georgia. A new thrips from citrus in Alabama. **39**, vi, 33-9, 47-8; 45.

**ORTHOPTERA.** **Hebard, M.**—Dermaptera and Orthoptera from the state of Sinaloa, Mexico. Pt. 1. **2**, xlviii, 157-96. **Hubbell, T. H.**—Notes on the Orthoptera of North Dakota. The Dermaptera and Orthoptera of Berrien County, Michigan. **88**, No. 113; No. 116. **Macfie, J. W. S.**—Observations on the role of cockroaches in disease. **98**, xvi, 441-48. **Morse, A. P.**—The European house cricket; hearth cricket. **5**, xxix, 225.

**HEMIPTERA.** **Bergroth, E.**—On some Neotropical Tingidae. **33**, lxii, 149-52. **Drake, K. J.**—Neotropical Tingitidae with descriptions of three new genera and thirty-two n. sps. and var. (Mem. Carnegie Mus., ix, 351-78.) **Ferris, G. E.**—Notes on Coccidae X. **4**, liv, 246-8. **Hungerford, H. B.**—Oxyhaemoglobin present in backswimmer, Buenoa margaritacea. **4**, liv, 262-3. **Hussey, R. F.**—Hemipterological notes. **5**, xxix, 229-33. (Hemiptera from North Dakota.) On some Hemiptera from Berrien Co., Michigan. **88**, No. 115; No. 118. **Peneau, J.**—Troisieme contribution a l'etude des metamorphoses des Hemipteres. (Bul. Soc. Sci. Nat. Ouest de la France. 1921, 35-43.) **Poisson, R.**—Armature genitale et squellette chitineux de l'organe copulateur chez les hemipteres aquatiques. **20**, 1922, 269-74. **Weiss & West.**—Notes on Livia maculipennis. **5**, xxix, 226-9.

**Knight, H. H.**—The N. Am. species of Labops. **4**, liv, 258-61. **Metcalf, Z. P.**—On the genus Elidiptera. **4**, liv, 263-4.

**LEPIDOPTERA.** **Bowditch, F. C.**—Notes on the gipsy moth in my unsprayed woods at East Marion, Mass., 1922. **5,** xxix, 213-16. **Hoffmann, C. C.**—Restos de una Antigua del Norte entre los lepidopteros Mexicanos. (Rev. Mex. Biol., iii, 1-37.) **Moore, S.**—A list of northern Michigan L. **88,** No. 114. **Schaus, W.**—Notes on the Neotropical Epipaschiinae, with descriptions of new g. and sps. **10,** xxiv, 208-41. New sps. of Hydriomena from Mexico and Guatemala. **15,** x, 205-18.

**DIPTERA.** **Akehurst, S. C.**—Larva of Chaoborus crystalinus (Corethra plumicornis). (Jour. R. Micros. Soc., 1922, 341-72.) **Aldrich, J. M.**—The Neotropical muscoid genus Mesembrinella, and other testaceous muscoid flies. **50,** lxii, Art. 11. **Dyar, H. G.**—Notes on tropical American mosquitoes. **15,** x, 188-96. **Stiles, C. W.**—Musca Linnaeus, 1758, and Calliphora Desvoidy, 1830. **68,** lvii, 176. **Young, C. J.**—Notes on the bionomics of Stegomyia calopus, in Brazil. **98,** xvi, 389-406, 425-39. **Warburton, C.**—The warble-flies of cattle. Hypoderma bovis and H. lineatum. **64,** xiv, 322-41.

**Garret, C. B. D.**—New sps. of Helomyzidae. **15,** x, 175-7.

**COLEOPTERA.** **Bounoure, L.**—Anomalie d'une larve de "Dytiscus." **95,** v, 391-97. **Burke, Hartman, & Snyder.**—The lead-cable borer or "short-circuit beetle" in California. (U. S. Dept. Agr., Bull. 1107.) **Dabbert, H.**—Ein hermaphrodit von Dytiscus marginalis. **115,** xxxviii, 1-3. **Fisher, W. S.**—The leaf and twig mining buprestid beetles of Mexico and Central America. **50,** lxii, Art. 8. **Herrera, M.**—Breve monografia del Megasoma elephas. (Secret. Agric. y. Fomento. Direc. Estudios Biol., Mexico. 1922. 16pp.) **Macnamara, C.** Tiger beetle larvae. **4,** liv., 241-6. **Obenberger, J.**—Beitrage zur kenntnis der Buprestiden. **111,** 1922, A, 12, 64-168.

**HYMENOPTERA.** **Browne, F. B.**—On the life-history of Melittobia ascasta; a chalcid parasite of bees and wasps. **64,** xiv, 349-70. **Cresson, E. T., Jr.**—The Bassett types of Cynipidae. **2,** xlviii, 197-203. **Cushman, R. A.**—The identity of Ichneumon coccinellae. **10,** xxiv, 241-2. **Enderlein, G.**—Beitrage zur kenntnis der Copeognathen VII. **52,** lv, 245-8. **Gennerich, J.**—Morphologische und biologische untersuchungen der putzapparate der H. **111,** 1922, A, 12, 1-63. **Hartley, E. A.**—Some bionomics of Aphelinus semiflavus, chalcid parasite of aphids. **82,** xxii, 209-36. **Plath, O. E.**—Notes on the nesting habits of several N. Am. bumble bees. **5,** xxix, 189-202. **Smulyan, M. T.**—New England sawflies of the genus Tenthredella. (Proc. Boston Soc. N. H., xxxvi, 383-465.) **Stuart, M.**—Amber and the dammar of living bees. **76,** cxi, 83-4. **Wheeler & Chapman**—The mating of Diacamma. **5,** xxix, 203-211.

## Insects of Ecuador.

Catalogo Sistematico y Sinonimico de los Odonatos del Ecuador. Por el Prof. Francisco Campos R., Zoólogo del Estado (1905), Catedrático de Ciencias Naturales y Cosmografia en el Colegio Nacional Vicente Rocafuerte. Revista, Coleg. Nac. Vic. Rocafuerte, Guayaquil, Año IV., Núms. 8 y 9, pp. 1-75, lam. 1-3. June—September, 1922.

For the past twenty-two years the author has occupied the chair of natural history in the College of Vicente Rocafuerte at Guayaquil and has devoted his free hours from professional duties to the cultivation of entomology. Papers by him on Heteroptera, Lepidoptera, Diptera, Coleoptera, Hymenoptera, Neuroptera, Trichoptera and Euplexoptera of Ecuador have appeared in earlier numbers of the *Revista* of the College from 1919 on. In the study of all of these groups he has sought the assistance of specialists in America and in Europe to determine the material which he and his friends have collected in the Republic of the Equator.

The present catalog embraces 126 species of Odonata, without including varieties and doubtful forms, belonging to 54 genera. Seven species are indicated from the Galapagos Islands, three were described as new from the author's material, 5 are still to be described and 52 were not recorded from Ecuador previous to their collection by the author. 'Many other species,' he adds, 'must surely inhabit the country, since they are mentioned from bordering regions, but I have preferred to omit these from my catalog, signalizing only those for which there are definite evidences of capture in the national territory.' Species reported from Ecuador in the existing literature, or whose occurrence therein rests on manuscript communications to the author by specialists, have, of course, been included, although many of these species are simply recorded as from "Ecuador." A list of Ecuadorian localities, with their altitudes in meters, chiefly those at which the author and his friends have collected, is given on pages 9 and 10. It consists of 29 localities in western Ecuador, 5 to 1280 meters, 14 in interandine Ecuador, 2588-3288 meters, and 3 in eastern Ecuador, 440-1800 meters.

Under each species is given the bibliographical references, including synonyms, the localities and months in Ecuador and not infrequently a note on habits. There are three half-tone plates showing the facies of 9 species of Zygoptera, 6 Aeschnidae and 10 Libellulidae, respectively.

We congratulate Prof. Campos on the publication of his catalog and hope that he may for many years continue his studies and enlarge still more our knowledge of the Odonata of his country.

Prof. Campos' Estudios sobre la Fauna Entomologica del Ecuador. 3. Coleopteros occupies pages 24-100 of the same *Revista* for December, 1921, and lists 548 species of 342 genera belonging to 62 families, from the literature and from his own collections. Three half-tone plates reproduce photographs of 28 species. Nos. 4, 5, 6 and 7 of the Estudios were published in the *Revista*, Año IV, Num. 7, for March, 1922, and deal respectively with the Hymenoptera (pp. 54-71, 2 half-tone plates of 13 spp.), 113 species of 50 genera; Neuroptera (pp. 71-73, 1 half-tone plate of 2 spp.), 14 spp. of Myrmeleonidae and Ascalaphidae; Trichoptera (p. 74), 2 spp. and Euplexoptera (pp. 74-77), 18 spp.

Philip P. Calvert.

# Doings of Societies.

## Entomological Section, The Academy of Natural Sciences of Philadelphia.

Meeting of September 28, 1922. Nine persons present. Director Laurent presiding. Mr. Frank R. Mason was elected a member.

LEPIDOPTERA.—Mr. Williams exhibited drawings of the male genitalia of the North American species of *Hesperia* and allied genera, and made some remarks on the strong characters presented by these organs and their value in determining species.

ODONATA.—Dr. Calvert presented eight specimens of Odonata from New Jersey and Pennsylvania to the collection. He also exhibited a male of *Gomphus dilatatus* Rambur, collected by Mr. Philip Laurent, at Gunntown, Florida, March 1-15, 1922, and remarked on the specific characters furnished by the terminal filaments of the penis. [Published in detail on page 87 of this number of the NEWS.] He also read a passage from "Our Search for a Wilderness," by M. B. and C. W. Beebe, describing a species of *Mecistogaster* capturing spiders in British Guiana, and exhibited a *Megaloprepus coerulatus* from Costa Rica which had a spider in its mouth at the time of capture; also a microscopic slide of the excrement of another *M. coerulatus* from the same country, in which a bit of the last tarsal joint and claws of a spider were visible.

---

Meeting of November 16, 1922. Director Philip Laurent in the chair. Nine persons present.

DIPLOPODA.—Dr. Skinner read a letter about an infestation by millipedes of a house at Haverford. Mr. Kisliuk reported an infestation of a field of imported bleeding-hearts by this pest working in the roots and destroying the entire planting.

LEPIDOPTERA.—Mr. Williams spoke about some more of his researches in the lepidopterous family Hesperiidae, showing some important genitalic characteristics by lantern projection of microscopic mounts.

DIPTERA.—Mr. Cresson made some comments on the more conspicuous genitalic structures in the dipterous family Micropezidae, illustrating his remarks by lantern projection of drawings. Mr. Laurent commented on the diversity of terms used for the same parts of the genitalic structure.—E. T. CRESSON, JR., Recorder.

---

## The American Entomological Society.

Meeting of October 19, 1922, in the hall of the Academy of Natural Sciences of Philadelphia. Dr. Henry Skinner, president, in the chair. Eleven persons present.

Mr. Cresson reported the following additions to the collection: 25 specimens (14 species) Hemiptera (Aradidae), United States, C. W. Drake; 23 specimens (12 species, 15 paratypes) Diptera Dolichopodi-

dae) United States, M. C. Van Duzee; 11 specimens Diptera from Florida, Philip Laurent; Paratype of *Zorotypus swezeyi*, Caudell, A. N. Caudell; 2 paratypes of two species Diptera from Illinois; 2 paratypes of 3 species Evaniidae from Peru; 3 Hymenoptera, Illinois and Peru, T. H. Frison; 2 paratypes of *Bremus kirbyellus alexanderi, Bremus sylvicola lutzii,* from United States, T. H. Frison; 2 specimens *Celeris calida* Butler, Lep. 15 specimens *Crabro destructor* from Hawaiian Islands, F. X. Williams, 1 Diptera, *Orophoro townsendi* Bez., type from Peru; 14 Diptera Trypetidae determined from Africa, Prof. M. Bezzi; 8 specimens (4 species) *Drosophila* (Diptera) Penna., Dr. P. P. Calvert; 5 specimens *Longitarsus subrufus* LeC. from Penna., F. M. Craighead; 1 photo of Frank R. Mason; 6 copy books containing numerous letters to entomologists and many other letters from entomologists to Mr. H. F. Bassett from his daughter, Mrs. Howard W. Ford; 78 photographs of entomologists purchased from Deutsche Entomologische Institut, Berlin.

ORTHOPTERA.—Mr. Rehn made a few remarks on the rarity of a fissate condition of the pronotum in the Blattidae. The speaker exhibited the genera *Schigopilia* and *Schistopeltis* of the Panchlorinae, which possess such fissations, while tendencies toward this type, as found in several related genera, were also pointed out.

LEPIDOPTERA.—Mr. Bayliss reported the capture of *Apatura celtis* (Lep.) at Burlington, New Jersey, this species not being recorded in Smith's list.

COLEOPTERA.—He exhibited a fine collection of the local Cicindela (Coleop.)

DIPTERA.—Mr. Kisliuk reported the presence of the Lesser Bulb fly larvae on Narcissus bulbs imported from Holland and exhibited adults and pupa of *Eumerus strigatus,* Fab. (Dipt.). Shipments of the plants were held up and thoroughly fumigated and action taken to prevent the introduction of the insect in this manner.

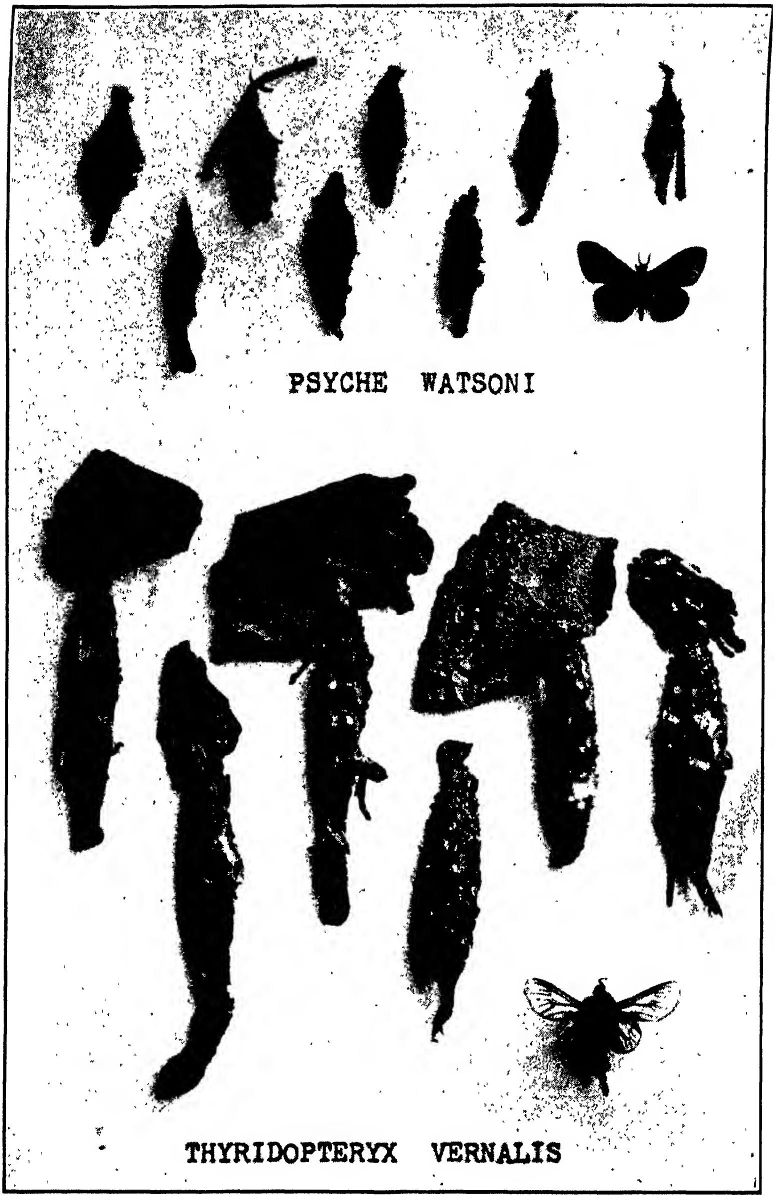
Mr. Rehn made some interesting remarks in regard to his last collecting trip with Mr. Hebard, particularly in Arizona.

R. C. WILLIAMS, *Recording Secretary.*

---

Meeting of December 11, 1922, in the same hall. Dr. Skinner presiding. Twelve persons present.

The annual reports were read and the following were elected to serve as officers and committees for 1923: *President,* Henry Skinner; *Vice-President,* J. A. G. Rehn; *Corresponding Secretary,* Morgan Hebard; *Recording Secretary,* R. C. Williams; *Treasurer,* E. T. Cresson. *Publication Committee,* J. A. G. Rehn, *Chairman,* E. T. Cresson, P. P. Calvert; *Finance Committee,* Morgan Hebard, *Chairman,* D. M. Castle, J. A. G. Rehn; *Property Committee,* E. T. Cresson, Jr., Morgan Hebard, Philip Laurent.—J. A. G. REHN, *Recording Secretary, pro tem.*




TWO NEW PSYCHIDS.—Jones.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

VOL. XXXIV APRIL, 1923 No. 4


CONTENTS



# Variation in Thyridopteryx: Two New Psychids (Lepid.: Psychidae).


By FRANK MORTON JONES, Wilmington, Delaware.


(Plates III, IV.)

In the *Psychidae*, wing-venation of the male has been largely employed in the characterization of species, genera and sub-families; but when, judged by this character, we not infrequently reach the absurdity that one-half of an insect falls to one species, genus, or sub-family, the other half to another genus or even to another sub-family, it becomes apparent that until we determine, for a given species, the prevalence and extent of such variation, this character considered alone must be most inconclusive and unsatisfactory.

Of our North American *Psychids* probably no species is more variable than *Thyridopteryx ephemeraeformis* Haw. The fol-

lowing notes on this species are based on the examination of fifty males, from a considerable range of food-plants and localities, the specimens taken at random from the breedings of a period of ten years. It is confidently believed that a single species only is represented in this material, and this belief is not modified by the extreme variability of structure manifested, for the full range of variation in any one venational character is not infrequently exhibited in a single asymmetrical insect.

If we consider Comstock's figure to represent the normal venation of *ephemeraeformis,* he shows an 11-7 veined insect with $R_3$ and $R_4$ (9 and 8) of primaries stemmed to the cell, $M_2+M_3$ (5 and 4) of both wings coincident, $Sc+R_1$ (8) of secondaries stemmed with $Rs$ (7)—then of the fifty examples studied, seventeen, or only 34%, approximate the normal venation (Plate IV, figs. 1 and 3).

With regard to the number of veins reaching the wing-margin, the most common variation is in the divergence of the normally coincident 4 + 5 of primaries (Plate IV, fig. 6), eight examples of the fifty showing these veins divergent at the margin, stemmed to the cell, on one or both primaries, and three showing these veins of secondaries (fig. 4) similarly divergent and stemmed. One example (fig. 9) shows vein 2, another (fig. 6) vein 6, forked at the margin on one primary; one lacks vein 9 (fig. 5) on one primary, another (fig. 10) vein 11; and several show vein 6 completely fading out before reaching the margin. In three examples (fig. 2) vein 7 on one primary is stemmed to the stem of 8 and 9, and in one example 10 is stemmed to the stem of 8 and 9; in two, a spur from the cubitus toward the anal veins (fig. 9) partly closes a cell bounded by these veins; in one example (fig. 5) vein 1c (Comstock's 1st Anal) of primaries, usually a short internal spur and often scarcely visible, is strongly developed to the outer margin.

On the secondaries, two examples (not illustrated) show on one side vein 6 entirely absent from cell to margin, and one example shows this vein absent on both secondaries; veins 7 and 8, normally slightly to widely divergent at margin, are rarely coincident from cell to margin, as shown in fig. 11 (*vernalis*); and the basal portions of these veins, in ten of the fifty, are modified as illustrated in figure 7 or figure 8, on one or both sides.

The primaries of seven of the fifty (figs. 9 and 10) show from one to four accessory cells formed by veins 10 and 11, 7, 8, 9, and 10, or even by 6 and 7, these cells usually occurring in one wing only. Figure 9 is a composite of the right and left primaries of the same individual; figure 10 is drawn from two examples, one lacking vein 11, the other

with 6 and 7 forming an accessory cell; all the other figures of venation are traced from individual wings. Whenever necessary for study, the wings were cleared with a brush and examined dry,—not chemically bleached and mounted in balsam, the latter method frequently causing the disappearance of weak veins.

A composite to exhibit the maximum complexity of venation indicated by the variations in these fifty specimens, counting the anal veins as one, and numbering consecutively all the others running to the margin, would show a 14-8 veined insect with a whole series of accessory cells; a composite to show the minimum venation indicated, a 9-5 veined insect with no accessory cell. It would be difficult to assign phylogenetic significance to many of these variations. Perhaps the most significant is the frequent furcation of 4+5, indicating the correct identification by Comstock of the normally missing vein of *ephemeraeformis* as *M2* (5), not *M1* (6).

Size, wing shape, density of scaling, number of antennal joints, leg armature, form and chitinization of the abdominal plates, to some extent the genitalia, share in the structural variability of this insect; so that several fictitious species might excusably be characterized, or a closely related insect escape detection, in this remarkable medley of structural variation. In the belief that the latter actually has occurred, it is here proposed to describe a form which has been under observation for many years, and which certainly deserves a name.

Few caterpillars have a longer list of observed food-plants than *ephemeraeformis*, for though it shows preference by especially abounding on arbor-vitae, cedar, willow, sassafras, locust, persimmon, button-ball, and many other trees and shrubs, yet lacking these it seems to thrive even on herbaceous plants. Its familiar life-cycle, described so frequently in the extensive literature of the species, is that of a single-brooded insect, emerging in the late summer or the fall, and passing the winter in the egg stage only. The systematic winter examination of hundreds of the "baskets" indicates the invariability of this life-cycle, at least in the more northern distribution of the species. In distinction from this polyphagous habit and this life-cycle, from southern Delaware to Georgia a related insect has been re-

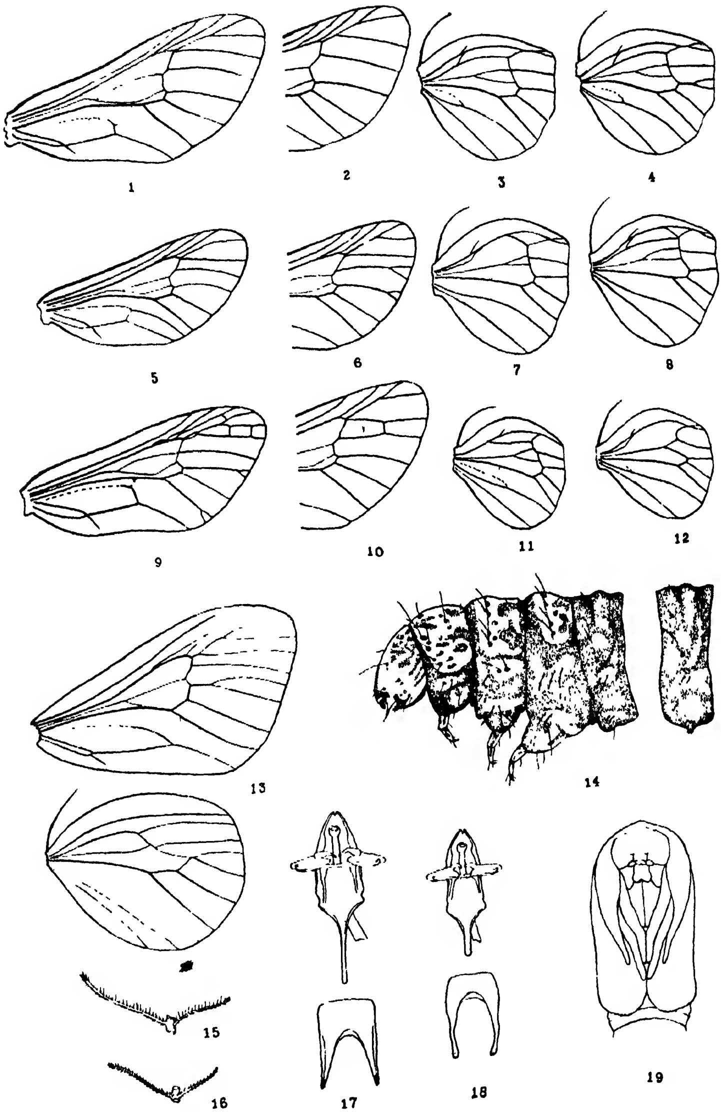
peatedly observed upon a single food-plant and which hibernates as a larva, completing its transformations in the spring. For this insect is proposed the name of

**Thyridopteryx vernalis** n. sp. (Plates III; IV, figs. 11, 12).

Larval case, affixed for pupation.—Length 38-50 mm.; diameter 8-9 mm. in the ♂, 11 mm. in the ♀; frequently affixed to the bark of the tree, often near the base of the trunk, by a flat button of silk, and rarely expanding the button into a twig-encircling band as in *ephemeraeformis;* the case of the ♂ is longer and proportionately more slender than is usual in *ephemeraeformis,* and the lower extremity, until stretched by the emerging moth, is contracted into a tail-like appendage; fine particles of bark are extensively incorporated into the silk composing the case, and the larger particles attached externally are usually flakes of bark or bits of lichen, rather than of leaf. In neither sex is the shape and texture of the case obscured by this attached material, as is so commonly the condition in *ephemeraeformis.*

Adult ♂.—Expanse 25 mm.; in appearance very similar to *ephemeraeformis;* the collar is usually conspicuously and contrastingly gray, the patagia sometimes mixed with gray; in shape and venation the primaries resemble those of *ephemeraeformis,* two of five examples showing 4 + 5 furcate at the margin, and none showing accessory cells; the secondaries are usually proportionately smaller than is common in *ephemeraeformis,* with highly arched costa and rounded rather than angulated outer margin; the venation of secondaries may duplicate that of normal *ephemeraeformis,* but in two out of five examples the course of vein 7 (the apparent 6th vein) is as in figure 12, and in one example as in figure 11, neither of these being duplicated in the fifty specimens of *ephemeraeformis* with which they were compared; in *vernalis,* 7 and 8 of secondaries are usually coincident from cell to margin, and are very rarely so in *ephemeraeformis.* The genitalia are not obviously different from those of *ephemeraeformis;* but the dorsal abdominal plates, in the material examined, are conspicuously narrower than in that species.

Described and illustrated from five adult males and many larval cases. *Type locality:* Seaford, Sussex County, Delaware; emergences in May, from cases collected at Seaford, Delaware; Tilghman's Island, Saulsbury, and Ocean City, Maryland; Chincoteague Island, Virginia; the characteristic cases were also collected at Summerville, South Carolina, and Tallulah Falls, Georgia. The *type material* is in the collection of the author. Food-plant, *Pinus rigida* (and probably related pines, not distinguished).




THYRIDOPTERYX EPHEMERAEFORMIS, 1-10; T. VERNALIS, 11-12; PSYCHE WATSONI, 13-15,17,19; PS. GLOVERI,16,18.—JONES.

Larvae were obtained in the late summer and in the autumn, and in some numbers and of various ages were successfully carried through the winter, but none lived to complete their transformations after becoming active in the spring. All the adults secured were from cases gathered in the open and after pupation, in April or May. This insect has thus been under occasional observation since 1892. The repeated evidence of its spring emergence, its consistently characteristic larval case and single food-plant, seem fairly conclusive of its specific distinctness, aside from the color and structural characters which usually serve to separate it from *ephemeraeformis;* if further study of the latter species, especially in its southern and southwestern distribution, should necessitate a change of status, the name *vernalis* may properly be applied to the spring-emerging gray-collared form here described as distinct.

Among the insects collected in Haiti in the spring of 1922 by Mr. F. E. Watson, of the American Museum of Natural History, were numerous specimens of a small *Psychid* found feeding upon the leaves of the Sea-grape, *Coccolobis*. Included in this material were old cases spun fast for pupation, and living larvae of various ages. The latter, brought to this country in April, accepted a variety of food-plants including leaves of maple and rose, and upon rose a few were carried through to maturity. Averaging slightly larger but otherwise resembling our *Psyche* (*Platoeceticus*) *gloveri* Packard, this insect presents structural characters conclusively separating it from that species, nor does it seem to be among the few *Psychids* recorded from the West Indies, and for it is proposed the name of

**Psyche watsoni** n. sp. (Plates III, IV; figs. 13-15, 17, 19.)

*Larval case.*—15-20 mm. in length; widest at the middle, tapering toward both ends; of grayish silk and of rather smooth texture, more or less decorated with small fragments of leaf or bark, irregularly applied; in some examples these completely cover the silk, usually without obscuring the shape of the case; in others the pale gray silk is only flecked with minute particles of extraneous matter.

*Larva,* last stage (Pl. IV, fig. 14).—Length 13-20 mm; width of head 1.6 mm. Dark brown; the head and the heavily chitinized portions of the thoracic segments are pale (almost white) with dark brown dots and foliaceous bars, much as in *Oïketicus.* The upper portion of the

front is pale, conspicuously outlined laterally by the dark frontal sutures, and below by the dark brown clypeus, from which an upward extension of the dark area surrounds each of the two frontal setae, leaving the pale area of the front symmetrically arrow-shaped; the frontal punctures are included in a double brown dot; the ventral margin of the clypeus and the antennal basal cones are pale, the labrum and the distal portions of the antennae ferruginous. The frontal setae are well below the level of the frontal punctures, and the 2nd adfrontals are slightly above the punctures.

*Pupa of* ♂ (Pl. IV, fig. 19).—Length 8-10 mm.; reddish amber brown, darker on the distal portion of the wings, and almost black on the caudal margins of abdominal segments 2, 3, 4, 5, 6 and 7, on each of these segments forming a broad well-defined dark ring about the abdomen; the wings extend ventrally almost to the cephalic margin of the 4th abdominal segment; the antennae and the prothoracic legs terminate opposite the caudal margin of the first abdominal segment; a dorsocephalic spiny ridge, the teeth directed cauded, is present on segments 4, 5, 6, 7 and 8, the ridge shortened but the teeth enlarged on 8; of segments 3, 4 and 5 (sometimes vestigally on 2) each bears a dorsocaudal row of fine short spines, their points bent cephalad; the caudal thorns are weak and are not darkened, and the spiracles are raised slightly above the body surface.

Compared with the pupa of *gloveri* Packard, *watsoni* has longer maxillae (Mosher nomenclature), these exceeding the labial palpi by nearly half their length.

*Pupa of* ♀.—Length 11-13 mm.; bright mahogany brown, the caudal margins of the free abdominal segments black and conspicuously contrasting.

*Adult* ♂.—Expanse 15-20 mm. A sooty black opaque-winged species of rather slender build, the abdomen in dried examples equalling or slightly exceeding the secondaries. The antennae are dark, broadly bipectinate, and have about 31 joints; compared with *gloveri*, the antennae of *watsoni* (fig. 15) are longer, more broadly pectinated, and have greater number of joints; the pectinations are smooth surfaced,—not irregularly cross-striate as in *gloveri*,— and the hairs which clothe the pectinations are longer and finer and are more regularly arranged in spaced rows,—not short, stubby and irregularly placed (fig. 16) as in *gloveri*. The fore tibiae are not spined. The genitalia of *watsoni*, (fig. 17) especially the saccus, are proportionately longer and narrower than those of *gloveri*, and the furcations of the "8th sternite" plate are tapering, pointed, and regularly divergent in *watsoni*,—in *gloveri* (fig. 18) more uniformly narrow and at their extremities rounded and spoon-like.

The costa of primaries is arched, the apex rather acute; the secondaries rounded. The primaries have twelve veins; 4 and 5 are stemmed

to the cell; 8 and 9 are stemmed, and 7 may proceed from the same point on the cell, or may be shortly stemmed to the stem of 8 and 9. The secondaries have eight veins, with 4 and 5 shortly stemmed or from a common point; 7 and 8 are not usually connected. The anal veins of primaries send one short branch to the inner margin at about one-fourth the wing length from the base, and coalesce beyond the middle of the wing. The venation of *watsoni* (fig. 13) is thus substantially identical with that usually presented by *gloveri* Pack., which, contrary to Packard's characterization of the genus *Platoeceticus*, is more frequently 12-8 than 12-7.

Described and illustrated from five males, bred from larvae collected in April, 1922, by Mr. F. E. Watson, at Aux Cayes, Fort Ilet District, Haiti, and emerging as adults May 22 to September 1, 1922. The *type* and *type material* are deposited in the American Museum of Natural History, New York. This insect is named in honor of its collector, through whose kindness the author has been permitted to examine and describe it.

Acknowledgment is also due to the Rev. C. R. N. Burrows, of Stanford-le-Hope, England, whose prolonged study of the palaearctic *Psychidae* is providing a basis for the intelligent use of the genitalia and the abdominal plates in the classification of this difficult group, and who has most generously, in advance of publication, placed all of his results at our disposal.

## Notes on Rhodobaenus 13-punctatus (Ill.), the Cockle-Bur Bill-Bug (Col.).

By Harry B. Weiss and Ralph B. Lott, Highland Park, New Jersey.

This species which is listed by Smith (Ins. N. J., p. 397) as occurring throughout New Jersey and breeding in the stems of a variety of weeds such as *Ambrosia*, *Helianthus*, *Oenothera*, *Xanthium*, etc., was made the subject of some observations during the summer of 1922 and the following notes represent our summarized findings:

The adult overwinters and in the central part of New Jersey (Monmouth Junction) eggs are plentiful in the field during the first two weeks of June, although newly hatched larvae can be found during the first week of June. The adults do consider-

able feeding at this time, puncturing the stems and bases of the leaf petioles which injured places later turn black and become distorted. All of our observations were confined to ironweed (*Vernonia noveboracensis*) as other weeds did not appear to be infested. In addition to Smith's host records, Riley (3rd Ann. Rept. Nox. Ben. Other Ins. Mo., 1870 (1871), p. 60) also mentions *Xanthium strumarium,* the common cockle-bur. Chittenden mentions *Eupatorium perfoliatum, Polymnia uvedalia, Cirsium* and *Silphium* in addition to those already listed (Bull. 22, U. S. Div. Ent. 1900). Webster (Bull. 40. Div. Ent. U. S. Dept. Agric., 1903) records the adult as feeding on the half-ripe seeds of the garden sunflower and the larvae as burrowing in the stalk. It is therefore evident that the species is more or less of a general feeder within a wide range of plants.

In ironweed most of the eggs appear to be deposited in the upper portion of the young stem. The egg cavity is a rather shallow, longitudinal cavity. In this depression will be found what appears to be a wisp of shredded tissue anchored to each end of the cavity and in the central part of this wisp is the elongate, whitish egg. Usually the wisp of tissue and the sides of the cavity become black and are more or less soiled with excrement. After hatching, the larva bores up the centre of the stem for a short distance and then downward, the entire larval cavity reaching an average length of about twelve inches. Many infested stems contain small openings full of grass and it is quite likely that these are made by the larva for the purpose of getting rid of borings, etc., as the larval cavities were comparatively free from such materials. Only one larva was found to a stem. By the first week of August many larvae are full grown and some have pupated. The pupal chamber, which is from one to one and one-half inches long, is usually located in the middle of the larval cavity and separated from it by closely packed borings. About the last of August and beginning of September adults appear, escaping through circular openings in the sides of the stems.

*Egg.* Length about 1.29 mm. Width about 0.6 mm. Elliptical with broadly rounded ends. Whitish.

*Mature Larva.* Form subcylindrical, tapering slightly at both ends,

more so posteriorly, slightly curved, smooth, creamy white, head reddish brown. Head comparatively small, subcircular; collum absent; epicranial suture distinct; epicranial halves bearing a few long chitinous hairs; frons triangular slightly tuberculate anteriorly, bearing two chitinous hairs near lower edge, one on each side near angles. Clypeus transverse, light brown. Labrum with anterior edge arcuate and fringed with closely placed short, chitinous hairs; two hairs arising from middle surface of labrum. Ocelli convex, lenticular, on front margin of head. Antennae minute, single jointed, almost obsolete. Gula indistinct, membraneous. Labium with mentum and submentum fused, anterior edge circular, terminating in an acute point posteriorly. Labial palpi short, two-jointed. Maxilla bearing several chitinous hairs, fused with labium to near apex; maxillary palpi two-jointed, first joint barrel-shaped, apical joint minute; galea absent; lacinia fringed with short chitinous hairs on inner surface. Mandibles triangular, broad across base, slightly bifid at tip.

Thoracic segments slightly compressed rather short. Prothoracic segment slightly embrowned dorsally. Thoracic and abdominal segments transversely wrinkled, each with three dorsal plicae.

Abdominal segments four, five and six sometimes somewhat swollen and constituting the widest part of the body. Last two abdominal segments slantingly truncate dorsally, penultimate one bearing two oval brownish areas, each enclosing two or three black, thread-like marks; between these oval areas is a slight, broad elevation bearing two chitinous hairs. On lateral side of each oval area is a large broad tubercular elevation bearing two setae; anterior to each oval area is a transverse tubercular area bearing two chitinous hairs, one on either side of a median line. Ultimate segment bearing eight chitinous hairs in groups of four each on either side of middle. True legs absent, indicated by ambulatory tubercles, each bearing four comparatively long hairs and sometimes several short ones. Cerci absent. Hairs on head and posterior abdominal segments are the longest. Length of larva about 13 mm. Greatest width about 4 mm.

*Pupa.* Creamy white. Elongate, subcylindrical, third and fourth abdominal segments sometimes wider than remaining abdominal segments or thoracic segments. Head bearing a single pair of chitinous hairs near anterior edge. Beak bearing three pairs of chitinous hairs, one pair above and one small pair below antennal insertion and one pair at the antennal insertion, several minute hairs present. Antennal cases oblique, reaching to near the ends of the femora of the first pair of legs.

Femora of all pairs of legs bearing a short chitinous hair near distal end. Prothorax bearing a transverse row of six chitinous hairs situated about one-half way between anterior and posterior edges; posterior to this row, on each side and nearer the posterior and lateral edges are two closely placed hairs. Mesothorax bearing a diagonal row of three

hairs on each side of a median line and several scattered, smaller ones. Metathorax with a transverse row of chitinous hairs, three on either side of a median shallow depression.

Abdominal segments each bear a row of dorsal, transversely placed chitinous hairs, four of them being closely placed on either side of middle on all but seventh segment which bears three closely placed ones. Ultimate segment with two lateral tubercles each bearing a group of four long, chitinous, downwardly directed hairs. All hairs becoming longer posteriorly. Large lateral spiracle on prothorax. Length of pupa about 10 mm. Width, 3-4 mm.

*Adult.* This was described by Illiger in 1791 (Schneid. Mag. V. 1791, 613). Blatchley and Leng (Rhyn. N. E. Amer. 1916, p. 550) give a redescription of the beetle and state that it occurs over the entire United States. In Leng's "Catalogue of the Coleoptera of America North of Mexico," two varieties based on color are listed, these being *pulchellus* (Schon.) and *quinquepunctatus* (Say). The species is variable insofar as its spots are concerned and this variation is probably responsible for the nine synonyms listed in this catalogue. Chittenden (loc. cit.) has observed two chalcidid parasites, one being *Habrocytus rhodobaeni* Ash.

## The Anal Veins in the Wings of Diptera.†

By Alex. D. MacGillivray, Urbana, Illinois.

The students of Diptera as a rule recognize only a single anal vein. Some exception is found to this in the superfamily Tipuloidea where most, if not all, species have at least two easily recognized anal veins. To the first of these Osten-Sacken applied the name of axillary and to the second the name of spurious. This terminology is used by Williston in the last edition of his *Manual.*

Osten-Sacken, although he figures the wings of forty species of Tipulidae, shows in only a few cases an additional anal vein to the two just named and one of these figures, the wings of *Gnophomyia tristissima,* is the only figure of a tipulid wing showing this additional anal vein accurately.

Needham, in his paper on the wings of the Tipulidae, recog-

†Contributions from the Entomological Laboratories of the University of Illinois, No. 79.

nizes only two anal veins. The additional vein is not shown on a single one of his many figures, many of which are very inaccurate for the anal region. This additional anal vein, however, can be readily identified on each of the six figures of wings reproduced from photographs. This additional vein is not shown on any of the over two hundred and fifty wings of Tipuloidea figured by Alexander.

Redtenbacher, the first author to use a uniform system for the naming of the veins of the wings of insects, in his classic paper on the wings of insects, *Flugelgeader der Insecten,* shows fairly accurately the three anal veins in a wing of a *Tipula,* but it is doubtful if he appreciated the full significance of his figure.

Comstock in his *Manual* shows in practically every figure this additional anal vein. It should now be stated that this additional anal vein is the first anal vein or *1st A.* The figure of *Protoplasa* which shows only a single anal vein was copied from Osten-Sacken. It is very inaccurate in the anal region. For this wing, as well as all the wings of the Tanyderidae, contains three anal veins. While the artist, who made the figures of Comstock, was consistent in showing the first anal vein in practically every wing, he has rarely drawn this vein accurately. Attention should be called to the fact that Comstock did not recognize the structure here designated as the first anal as a distinct vein, but only as a fold, the anal fold.

Comstock and Needham in the *Wings of Insects* have not departed from the interpretation given by Comstock in his *Manual.* The drawings used in making the figures for the *Manual,* relabelled with their new system of letters instead of the numbers used by Redtenbacher, are used.

Comstock in *The Wings of Insects* has the following to say about the anal veins of the Diptera:—"In most Diptera the first anal vein is wanting as a distinct vein but in many there is a suture-like line, the anal furrow, immediately back of cubitus and closely parallel with this vein; this is a vestige of the first anal vein; this furrow is represented in several of the figures in this chapter by a dotted line. The first anal vein is retained, however, in certain Asilidae; where, although some-

what shortened, it is a distinct vein extending from the base of the wing to near the point where vein *Cu* forks. The second anal vein is the most persistent of the three anal veins; it is well preserved in many families; and is represented in several of the figures in this chapter. The third anal vein is well-preserved in comparatively few forms, although a vestige of it exists in many. It is well preserved in *Tipula* and is fairly, well preserved in *Stratiomyia*." This is an excellent, concise, general statement of the anal region of the dipterous wings as I understand it.

There are several features existing in the proximal end of the wings of Diptera not included in the above account. It is unfortunate that the expense of reproducing figures is such that figures cannot be included, as the structures to be described have not been figured. They will soon be shown, however, in a number of wings in a morphological text-book to be printed soon, it is hoped. An examination of the proximal portion of almost any tipulid wing, as *Tipula cinctans,* shows a long area behind $R+M$. There is extending into this area three long spurs, two of which, if they are represented upon figures, are usually shown as extending obliquely toward $R+M$ with which they are usually shown as fused. They are never fused, however, so far as I have observed, but their direction and position are due to folds in the wing membrane which they support. The first spur extends from opposite the proximal end of cubitus and the caudal end of the arculus. It is always present in the Tipulidae. The second spur is always much longer than the first and while it is found in all Tipulidae it is also distinct in many other Diptera, as for example, *Culex, Dixa, Rhyphus, Leptis, Tabanus* and *Eristalis*. The second spur appears, particularly in the Tipuloidea, as a continuation of the second anal vein. The third so-called spur, which is frequently long, especially so in *Tipula,* is generally omitted from figures and appears to be a direct continuation of the third anal vein. The first two of these so-called spurs are true spurs and may be known as the cubital and anal spurs respectively, but the other projection represents the combined cubitus and three anal veins.

In *Tipula* a cross-vein-like structure extends from cubitus

to the second anal vein opposite the caudal end of the arculus. This apparent cross-vein is considered as the continuation of the stem of cubitus. Comstock has shown in the case of *Sialis* and other species from a study of pupal wings that this is the actual course of cubitus. That such must be the course of cubitus in the Diptera seems self-evident. This transverse part of cubitus is not always located opposite the arculus but may be situated distinctly nearer the proximal end of the wing, as in *Cladura* and *Tricyphona*. In *Rhyphus, Scenopinus* and *Hilaria,* where the cubital spur is not represented, the transverse part of cubitus has changed its course and extends lengthwise of the wing. *Eulonchus, Midas* and *Eristalis* show an almost complete suppression of the transverse part of cubitus and a large anal spur continuous with cubitus and the second anal vein. The Tanyderidae, particularly *Tanyderus* and *Protoplasa,* show an entirely different modification of this region so far as I have studied it. The cubital spur is as a rule not present while the transverse part of cubitus has been suppressed by the anastomosis of the second anal vein with the longitudinal part of cubitus at the caudal end of the arculus.

The first anal vein in the Diptera is frequently a distinct vein in the Nematocera, particularly at its point of origin, sometimes extending nearly to the margin of the wing and usually to or beyond the cubital fork. The enlarged proximal portion of this vein, which is always vein-like, usually arises from the angle formed by the union of the transverse part of cubitus and the second anal vein, sometimes from the second anal vein. The fact that it has actual origin from the transverse part of cubitus is sufficient to disqualify it as a furrow and to prove Comstock's contention that it is a true vein. If it is a true vein, it cannot be other than the first anal vein. Through the changes in the position and direction of the transverse part of cubitus in the Brachycera and Cyclorrhapha, there is apparently a change in the origin of the first anal vein. An examination of such wings as *Leptis* and *Tabanus,* however, leaves no doubt that even in the specialized Diptera, the first anal vein arises from the transverse part of cubitus.

There is no question that the anal spur is a spur formed on

the angle of the combined cubitus, first and second anal veins in the wings of the Tipulidae where the three proximal projections extending into the area on the caudal side of $R+M$ are usually present. That the single projection usually figured as a continuation of cubitus in the wings of the specialized Diptera is homologous with the anal spur in the Tipulidae is easily proven by an examination of the wings of such genera as *Rhyphus, Eulonchus, Hesperinus, Eristalis, Midas, Scenopinus, Hilaria, Psilopus, Conops, Stratiomyia* and *Erax*, where the third so-called spur, the stem of $Cu+A$ is present. The $A$ of the formula just used is the equivalent of *1st* $A+$*2nd* $A+$*3rd* $A$ and is always used in this sense.

In many Tipulidae there is, near the caudal end of the transverse part of cubitus, another transverse cross-vein-like structure, which is here homologized as $Cu+$*1st* $A+$*2nd* $A$. In the genera named in the preceding paragraph there is some variation in the portion of the caudal vein preserved; in *Rhyphus*, for instance, the distal part of *3rd* $A$ is distinct and the proximal portion represented by folds, while in *Erax* and *Scenopinus* the combined proximal portion is distinct and the most of the distal portion of *3rd* $A$ has disappeared.

The wings of *Protoplasa fitchii* and other tanyderids show three anal veins, as already stated, and not a single one as the figure of Osten-Sacken would suggest. The first anal is of the same distinctness as this vein in the Tipulidae and was undoubtedly considered as a fold and for this reason omitted from the figure. The cubital spur is wanting and the anal spur is long. The stem of $Cu+A$ is prominent while the free part of the third anal vein is short; instead of extending toward the distal end of the wing, it extends obliquely proximad in line with the cross-vein-like portion of the fused $Cu+$*1st* $A+$*2nd* $A$.

The correctness of this interpretation of the relation of the cubital and anal veins of the proximal end of the wing rests or falls upon the question whether the transverse cross-vein-like vein opposite the caudal end of the arculus in the Tipulidae is the continuation of the stem of cubitus or not. Comstock shows such a modification of the base of cubitus in the Tri-

choptera, Micropterygidae, and Hepialidae. I believe that a similar switching has occured in the Diptera and that the veins of the anal region should be homologized as stated above. Unfortunately the pupal wings offer no corroborative evidence in this order, since the tracheae do not map out the course of the veins.

I am especially indebted to Dr. Charles P. Alexander, of the Massachusetts Agricultural College, for an opportunity to study his very extensive collection of mounted wings of Tanyderidae and Tipulidae.

## Observations on the Occurrence and Biology of Triatoma flavida in Cuba (Heterop.: Reduviidae).

By Prof. Dr. Med. W. H. Hoffman, Habana, Research Laboratory of the Health Department, Republic of Cuba

In March, 1922, Dr. S. C. Bruner, Entomologist of the Agricultural Station of Santiago de las Vegas, published a notice that he had received from the eastern part of Cuba a Reduviid, which he had identified as *Rhodnius prolixus* Stål. The notice attracted my attention because the Reduviids, especially *Triatoma conorhinus* (formerly *Conorhinus megistus*) and *Rhodnius prolixus* are known as natural carriers of human trypanosomiasis in South America, and I had been seeking for those Reduviids in Cuba for some time, though I was informed by experts that they do not exist here, also that the disease just mentioned is not observed in Cuba.

It seems really that this insect is very rare in Cuba. Besides the one or two specimens of Dr. Bruner, I have been able to obtain one more from the same source. But all the other attempts, to get animals or any notice about them, failed. There is no doubt, however, that the animal belongs to the fauna of Cuba, because it is already found in the well-known collection of the Museo Gundlach of Habana. Lately I heard of its occurrence in the provinces of Camaguey and Santa Clara. Recent information from the U. S. National Museum in Washington, however, is to the effect that it is really *Triatoma flavida,* described by Neiva in 1912 from the type in the Museum in Washington.

Fortunately the animal which I have is a female which laid many eggs from which I have been able to rear a great number of larvae, so that I could make a series of biological observations which may have some interest, although I do not think it necessary to give a detailed description of the insect, which is very similar in its form and size of 3 cm. to *Triatoma conorhinus,* but having a color which is more yellowish grey.

The natural habits in Cuba are little known. In South America the Reduviids live in human houses; but possibly that is a recent habit and it might be, that in this country they prefer other conditions, perhaps even another host.

I have fed the female for six months with my own blood, because I wanted to know if the animal is infected, which seems not to be the case, also in the contents of the intestines I never found suspicious organisms, especially no flagellated forms of protozoa.

The female has laid eggs every day, from June 18 to the present day (December 1), on the whole about 600 eggs. From June to the beginning of September all the eggs, about 370, were fecundated. I suppose that the female, being isolated, must have kept in its organs sufficient quantity of sperm for fecundation since the last copulation with a male before being caught. All the eggs, laid since September, about 200, proved to be sterile.

The eggs are whitish yellow, of regular oval form, 1.5:2.5. mm. in size. They have at one end a cover, which opens in a regular line, to let the ripe embryo pass. The eggs, if fertilized, assume in a few days a pink color, the embryo being transparent through the chitinous wall of the egg. After 2-3 weeks the young larvae come forth, being very vivid from the beginning. They are of darkish color and like to put some particles of dust on the surface of their bodies to be less visible. They begin to suck blood after some days very easily. I used to feed them on my arm every 7-9 days, though they can live a longer time without food. Until now they have developed very well, but in 5-6 months have not reached more than 12mm. in length, so that the whole development will take more than one year. The bite is not painful but generally the next day some swelling develops.

Many times I have observed that the larvae easily suck the blood from the well filled abdomen of other larvae or of the mother instead of from the human skin. This observation is of special importance for pathology, because in many diseases it is supposed that the germs are transmitted hereditarily in the arthropod host. This question must be studied anew, because the observations on *Rhodnius* show that the larvae may become infected by sucking blood from infected insects, producing the impression of hereditary transmission if only the fact is considered, that they were not given a chance to suck blood from a patient. Of course the corresponding observations may be much more difficult in other animals than in *Rhodnius*.

Undoubtedly the presence of *Triatoma* is of great hygienic importance for Cuba and it will be necessary to pay careful attention to the study of the presence of trypanosomal infection in man and to its possible importation from South America and to prevent an eventual infection of the Reduviids.

## Additional Records of Lepidoptera from North Carolina. I. Papilionidae to Noctuidae both Inclusive.

By C. S. BRIMLEY, Division of Entomology, N. C. Department Agriculture, Raleigh, North Carolina.

This list contains species not listed in previous papers by us on the Lepidoptera of North Carolina (see Entomological News, March, 1907, p. 94, April, 1904, p. 120, and January, 1909, p. 33).

### I. BUTTERFLIES.

PIERIS NAPI Linn. Spruce, several specimens taken in late May of 1912 and 1913.

TERIAS ELATHEA Cramer. Smiths Id., summer, 1909, C. L. Pollard.

HELICONIA CHARITONIA Linn. Skinner in his Catalog of Rhopalocera gives its range as North Carolina to Florida.

PHYCIODES PHAON Edw. Smiths Id., summer, 1909, C. L. Pollard.

DANAIS BERENICE Cramer, Southern Pines, Beaufort, Whiteville and Smiths Id., all eastern localities, May to August.

DEBIS CREOLA Skinner. Two males taken by myself at Raleigh on September 29, 1902, and in August, 1911.

LYCAENA SCUDDERI Edw., Blantyre, mid May, 1908, F. Sherman.

THECLA HENRICI G. and R. Raleigh and Tryon in April, these records being attributed to *T. irus* in Ent. News for March, 1907, but *irus* remains on our list by virtue of specimens of that species taken at Asheville by J. H. Comstock on June 30 and July 3, 1901 and at Blantyre by Sherman in mid-May, 1908.

PAMPHILA ETHLIUS Cramer. Magnolia, early October, 1911, larvae very destructive to cannas, and adults bred from same. S. C. Clapp.

PAMPHILA ARROGOS B. and L. Richmond County, August, 1893, F. M. Jones.

PAMPHILA MACULATA Edw., Wilmington, August, 1893, F. M. Jones.

II. MOTHS.

HEMARIS DIFFINIS Boisd. Joanna Bald, near Andrews, mid May, 1908, one, FS.

TRIPTOGON LUGUBRIS Linn. Southport, Nov. 4, 1919, one, J. E. Eckert.

AMPELOPHAGA CHOERILUS Cramer. Raleigh, bred from larvae on *Azalea nudiflora* in May, and taken in June, July and August; Southern Pines, taken by Manee in August.

AMPELOPHAGA VERSICOLOR Harris, one bred from larva on *Cephalanthus* May 9, 1909.

SPHINX CHERSIS Hübner. A battered specimen taken at light at Raleigh, June 17, 1912.

SPHINX EREMITUS Hübner. Raleigh, Sept. 22, 1910, a full grown larva taken on *Monarda*, also recorded from Mitchell County.

SPHINX KALMIAE S. and A. Raleigh, July 13, 1914, one bred, also taken at Chapel Hill in May, 1916, by G. B. Lay.

CHLAEONOGRAMMA JASMINEARUM Bdvl. Two under light at Raleigh in late July, taken by G. B. Lay.

PAONIAS ASTYLUS Drury. Raleigh, Aug. 31, 1914, one at light.

PAONIAS MYOPS S. and A. Raleigh, Sept. 7, 1914, one caught by cat; also taken at Southern Pines by Manee in August, 1908.

LYCOMORPHA PHOLUS Drury, Lake Fairfield, August, 1904, F. M. Jones.

CLEMENSIA ALBATA Pack. Raleigh, late August, one.

OZONADIA UNIFASCIA G. and R. Raleigh, common on goldenrod flowers in September and October, 1914, also taken in mid June, 1914.

UTETHEISA ORNATRIX Linn. Southern Pines one specimen, A. H. Manee.

HAPLOA CLYMENE Brown. Brinkleyville, one July 16, 1912, taken and sent in by Miss Mary Hinton.

HAPLOA COLONA Hübner. Lake Ellis, very common in May and June, 1905 to 1908, also at Clayton, May 22, 1902.

HAPLOA LECONTEI var DYARI Merrick. Southern Pines, June 11, 1907, June 13, 1914, A. H. Manee.

ESTIGMENE CONGRUA Drury. Raleigh, May, April, July and August, not uncommon, also at Spruce in late May, 1912.

APANTESIS ANNA Grote. Balsam, one in collection, T. M. Rickards.

APANTESIS MICHABO Grote. Southern Pines, April 4, 1912, Manee.

APANTESIS PLACENTIA S. and A. Southern Pines, June, 1920, W. T. Davis.

APANTESIS RADIANS Walker. Raleigh, May, July and September, also taken at Southern Pines.

APANTESIS VIRGO Linn. Balsam, Blowing Rock, Black Mt., and Hendersonville, all mountain localities, in July and September.

APANTESIS VITTATA Fabr. Raleigh, July and October.

PYGARCTIA ABDOMINALIS Grote. Southern Pines, A. H. Manee.

HALISIDOTA LONGA Grote. Raleigh, mid June, 1907, one, FS.

HALISIDOTA MACULATA Harris. Southern Pines, one, Manee.

CHARADRA DERIDENS Guenée. Raleigh, late August, 1919, one, CSB.

ACRONYCTA BETULAE Riley. Hamlet, August, 1892, F. M. Jones.

ACRONYCTA DACTYLINA Grote, same data as preceding.

ACRONYCTA EXILIS Grote. Raleigh, July and August.

ACRONYCTA HAMAMELIS Guenée. Mitchell Co., July, Dr. H. Skinner.

ACRONYCTA HASTA Guenée. Raleigh, June, Hamlet, August.

ACRONYCTA LITHOSPHILA Grote. Raleigh, May 22, 31, 1921, CSB.

ACRONYCTA OVATA Grote. Raleigh, June and July.

ACRONYCTA SUBOCHREA Grote. Raleigh, April, one male.

PHOEOLOSIA BRIMLEYANA Dyar. Raleigh, September 8, 1907, CSB.

CHYTONIX PALLIATRICULA Guenée. Raleigh, March and April; Hamlet, August.

BAILEYA DOUBLEDAYI Guenée. Hendersonville, July, 1907, FS.

ATHETIS TARDA Guenée. Raleigh, early September, 1909.

PERIGAEA SELENOSA Grote. Raleigh, mid August, 1919.

PERIGAEA XANTHIOIDES Guenée. Southern Pines, July, August, 1901, FMJ.

HADENA ARCTICA Boisd. Mitchell Co., July, Dr. Skinner.

HADENA DEVASTATRIX Brace. Lake Fairfield, August, 1904, FMJ.

HADENA FRACTILINEA Grote. Raleigh, late September, 1909.

HADENA LIGNICOLOR Guenée. Mitchell Co., July, Skinner.

HADENA MODICA Guenée. Raleigh, early September, Lake Fairfield, August, Mitchell Co., July.

HYPPA XYLINOIDES Guenée, Spruce (Haywood Co.) late May, 1912, CSB.

MAGUSA DISSIDENS Felder, Raleigh, mid and late August, 1919, CSB.

RHYNCHAGROTIS ALTERNATA Grote, Raleigh, in September and October.

EUERETAGROTIS PERATTENTA Grote, Mitchell Co., July, Skinner.

SEMIOPHORA BADICOLLIS Grote. Raleigh, October.

AGROTIS NORMANNIANA Grote, Grandfather Mt., September 21, 1915, FS.

AGROTIS UNICOLOR Walker, Grandfather Mt., September 2, 1915, F. Sherman.

PERIDROMA RUDENS Harvey, Hamlet, August, 1892, FMJ.

Noctua bicarnea Guenée, Blowing Rock, August, 1906, FS.

Feltia gladiaria Morrison, Raleigh, moths scarce in October, although the larvae are the worst and commonest of the spring cutworms.

Porosagrotis vetusta Wlkr., Southern Pines, larvae taken by R. W. Caviness in April, 1901, also observed by W. L. McAtee at Poplar Branch (Anson Co.) in September, 1909 (Bull. 109, US. Dept. Agr., Div. Ent.)

Euxoa tessellata Harris, Blowing Rock, July, 1911, FS.; Mitchell Co., July, Skinner.

Mamestra adjuncta Boisd., Raleigh, late August, 1919, CSB.

Mamestra capsularis Guenée, Southern Pines, May 2, 1914, AHM.

Mamestra lorea Guenée, Spruce, late May, 1912, CSB.

Mamestra olivacea Morrison, Grandfather Mt., September 2, 1915, FS., Mitchell Co., July, Skinner.

Mamestra renigera Stephens, Raleigh, May, September and October.

Cirphis pseudargyria Guenée, Raleigh, August 8, 1915, CSB: Southern Pines, July, August, 1901, FMJ: Blantyre, early May, 1908, FS.

Orthodes vecors Guenée, Blantyre, early May, 1908, FS.

Graphiphora oviducta Guenée, Raleigh, April, May and September, not uncommon. Wilmington, April 13, 1920, Max Kisliuk.

Tricholita signata Walker, Raleigh and Lake Fairfield, in August, Mitchell county in July.

Graptolitha laticinerea Grote, Raleigh, December 8, 1918, CSB.

Graptolitha viridipallens Grote, Raleigh, January 24, 1920, CSB.

Cucullia convexipennis G. and R., Asheville, summer, 1915, Mitchell county, July.

Cucullia laetifica Lintner, Raleigh, mid August, 1911.

Bellura gortynoides Walker, Hamlet, August, 1892, FMJ.

Sphida obliqua Walker, Raleigh, several bred in April.

Gortyna nictitans Bork., Mitchell Co., July, Skinner.

Gortyna velata Walker, same data as preceding.

Papaipema polymniae Bird, Black Mts.

Pyrrhia umbra Hufn., Raleigh, June, August, Elizabeth City, August.

Eucirrhoedia pampina Guenée, Raleigh, late October, 1920, Waynes, September 14, 1908, Z. P. Metcalf.

Glaea inulta Grote, Raleigh, October, two.

Glaea viatica Grote, Raleigh, one each in October, November, January and February.

Rhodophora florida Guenée, Mitchell Co., July, Skinner.

Shinia gracilenta Hübner, Hamlet, August, 1892, FMJ.

Schinia gloriosa Strecker, Southern Pines, Manee.

Schinia jaguarina Guenée, Southern Pines, August, AHM.

Schinia lynx Guenée, August 16, 1909, AHM.

Schinia trifascia Hübner, Raleigh, August 13, 1921, CSB; Southern Pines, September 9, 1909, AHM.

Lygranthoecia brevis Grote. Southern Pines, Manee.

Lygranthoecia carolinensis Smith, Southern Pines, August.

Lygranthoecia constricta Edw., "NC" in Dyar's List N. Am. Lepidoptera, 1902, p. 190.

Acheroda ferraria Walker, White Lake (Bladen Co.), mid April, 1910, ES.

Plagiomimicus pityochromus Grote, Raleigh, August 28, 1907, CSB.

Plusia precationis Guenée, Raleigh, Southern Pines, Mitchell Co., April, May, July and August.

Eucalyptera bipuncta Morrison, Hamlet, Southern Pines, July, August, FMJ.

Eucalyptera humeralis Smith, "NC in August," Smith, Trans. A. E. S., XXIX, p. 220.

Eucalyptera obscura Grote, Raleigh, August 31, 1907, CSB.

Doryodes bistriaris Geyer, Beaufort, early June, 1909, FS.

Pleonectyptera habitalis Walker, Hamlet, July, August, 1901, FMJ.

Eustrotia musta G. and R., Raleigh, July 27, 1902, Hendersonville, July, 1907, FS.

Exyra ridingsii Riley, Hamlet and Southern Pines, July, August, White Lake, June.

Exyra semicrocea Guenée, Hamlet and Southern Pines, July, August.

Exyra rolandiana Grote, same date as preceding.

Spragueia onagrus Guenée, Raleigh, mid June, 1909.

Callopistria floridensis Guenée, Raleigh, bred in September and October from ferns, both outside and in greenhouse.

Hyamia perditalis Walker, Raleigh, mid June, 1907.

Drasteria crassiuscula Haw., Raleigh, mid June, 1909.

Euclidia cuspidea Hübner, Blantyre, early May, 1908, FS.

Meliopotis limbolaris Geyer, Lake Fairfield, August, FMJ.

Syneda graphica Hübner, Wilmington, April 13, 1920, M. Kisliuk.

Catocala sappho Strecker, Southern Pines, Manee.

Catocala vidua S. and A., Raleigh, September and October, rare.

Catocala retecta Grote, Lake Fairfield, August, 1904, FMJ.

Catocala obscura Str., Raleigh, July 21, 1920, CSB.

Catocala tristis Edw., Raleigh, July 8, 1921, CSB.

Catocala unijuga Wlkr., Raleigh, August 14, 1916, CSB.

Catocala neogama S. and A., Raleigh, September and October, rare.

Catocala muliercula Guenée, Raleigh and Beaufort in July, also from Southern Pines.

Catocala serena Edw., Raleigh, July 29, 1919, CSB.

Catocala similis Edw., Southern Pines, A. H. Manee.

Catocala fratercula G. & R., Raleigh, June 25, 1915, CSB.

Catocala gracilis Edw., Raleigh, July 15, 1915, CSB., Grandfather Mt., September 2, 1915, FS., also from Southern Pines.

Phoberia atomaria Harvey, Raleigh, March.

Grammodes smithii Guenée, Raleigh, August 2, 1919, one, CSB.

Phurys carolina Smith, Raleigh, two in May and August, CSB: White Lake, three in mid April, 1910, FS.

Trama detrahens Walker, Raleigh, July to September; White Lake, mid April: Southern Pines, July, August.

Pheocyma aeruginosa Guenée, Raleigh, April, June, July; Blantyre, May; Tryon, April, May, July, August.

Pheocyma bethunei Smith, Tryon, August.

Pheocyma coracias Guenée, Southern Pines, July, August, 1901, FMJ.

Pheocyma curema Smith, Raleigh, May, July, August; Tryon, June.

Pheocyma lineosa Walker, Raleigh, June to September, not uncommon.

Pheocyma metata Smith, Raleigh, July and August.

Erebus odora Linn., Raleigh, one in late August 1912, G. B. Lay; also once taken at Southern Pines by A. H. Manee.

Epizeuxis rotundalis Walker, Raleigh, mid August, 1909.

Zanclognatha cruralis Guenée, White Lake, June, 1910, FS.

Hormisa absorptalis Walker, Raleigh, June.

Gaberasa ambigua Walker, Raleigh, mid August, 1909, CSB.

Dircetis vitrea Grote, Raleigh, August.

Bomolocha baltimoralis Guenée, Hamlet and Lake Fairfield, August, FMJ.

Bomolocha madefactalis Guenée, Raleigh, late July, 1912, CSB.

Most of the really hard identifications are by or confirmed by Dr. H. G. Dyar, of the U. S. National Museum, to whom I express my sincere gratitude for his invariable kindness in identifying our material.

## Life-History of, and Notes on, Certain Chrysomelidae (Coleoptera).

By E. M. Craighead, Bureau of Plant Industry, Harrisburg, Pennsylvania.

During the past two years the writer has been collecting and studying the larvae of the family Chrysomelidae. Many of these larvae could be obtained only by rearing methods, and very often in order to identify the species it was necessary to rear them through the adult age. The following notes include records and observations made at the Field Laboratories of the Pennsylvania Bureau of Plant Industry, located at Chambersburg and North East, and are published at the suggestion of Prof. J. G. Sanders, Director of the Bureau.

**Oedionychis gibbitarsa** Say, Chambersburg, Pa., June 6.

Many adults were collected by sweeping on undetermined mint, and were then caged on plants brought into the laboratory. Copulation was observed the following day and two days later many eggs were collected in masses under small particles of debris. The eggs were placed on end and fastened together by some secretion. Oviposition continued over a period of two weeks, and an average of eleven days elapsed before larval emergence. In most cases the larvae emerged through a longitudinal slit, but in several instances they emerged through the end of the eggs. Eggs were never observed on the host plant. As soon as the larvae emerged they crawled upon the host plant and began to feed. After feeding for 18 days, average, the larvae entered the ground and constructed a small earthen cell within which they pupated four to five days later, transforming to adults eight days later. This species hibernates as adults.

**Zygogramma suturalis** Fabr., Chambersburg, Pa., August 8.

Fifty-seven larvae collected by sweeping ragweed (*Ambrosia trifida* L.). Larvae were transferred to potted plants in the laboratory. August 19, larvae entered ground and pupated two days later in small earthen cells. On September 1, adults emerged. Hibernate as adults.

**Monocesta coryli** Say, St. Thomas, Pa.

During August thousands of larvae were feeding on the foliage of slippery elm (*Ulmus fulva* Michx.) and by the latter part of the month the trees were completely defoliated. Many larvae were collected and adults reared with the expectation of securing some parasites, but without results. So abundant were the larvae that a few more years of defoliation will probably kill the trees. Fortunately this tree is not used in this locality for ornamental purposes and the infestation is quite limited; in fact, this appears to be the only place in the State where this insect has been recorded as destructive. Mr. George L. Ehrhardt records it from St. Thomas, August 4, 1913. The larvae hibernate 3-4 inches under the sod. This insect has been recorded previously from Virginia, Illinois, Kansas, Missouri and Florida.

**Chrysochus auratus** Fabr., Chambersburg, Pa., 1922.

Many adults were observed feeding and ovipositing on dogbane (*Apocynum cannabinum* L.). A short description of the egg-laying habits is presented by J. L. Zabriskie*. The newly hatched larvae fall to the ground and at once commence feeding on the tender roots. In May of the next year the larvae are nearly full grown and can be found feeding on the larger roots 1-6 inches below the ground. The bark on the roots is quite thick and very often the larvae by feeding will make a pocket large enough so that when the root is removed from the soil the larvae remain attached to the root. They hibernate in the larval stage. First pupae were found May 16; pupal duration about twenty days. Adults first noted June 4.

**Longitarsus subrufus** Lec., Chambersburg, Pa.

During July, 1921, hundreds of adults were collected by sweeping false gromwell (*Onosmodium hispidissimum* Mackenzie). Many of the adults were dissected and the females contained eggs. Egg-laying habits were not observed, but it is probable that the eggs are placed at the base of the plant on the surface or just under the ground. The larvae feed on the roots and are not very active. On examining infested roots one may find the larvae in their galleries or among the roots and when about to pupate they move a little distance away from the host.

The larva has a well-developed labrum, three-jointed maxillary palpus, ninth abdominal segment well developed, legs present, antennae two-jointed, body straight and cylindrical; 0.7 mm. to 1.2 mm. long and 0.1 mm. wide. It resembles the larva of *Diabrotica*. The larvae move around until they have formed well-defined cells in the soil and two days later pupate. Larvae remain in pupal stage from 9-15 days, averaging 10.6 days. Hibernate as larvae.

The adults feed on the leaves of *Onosmodium* and cut small irregular holes through them. Where the host was found the beetles were very abundant and by the latter part of August defoliation was complete. The adults are very active and when disturbed jump to another part of the host plant or fall to the ground where they conceal themselves under leaves. Previously recorded from Kansas and Indiana.

*Journal of New York Entomological Society—Vol. III, p. 192 (1895)

**Systena hudsonias** Forst., Chambersburg and North East, Pa.

This small Chrysomelid has many host plants, none of which are of economic importance except the grape. In Erie County, Pa., the feeding of the adults on grape foliage was so extensive that in many cases it reduced the vitality of the vine and the grapes did not mature properly. The leaves in many instances appear as if riddled with small shot and they then turn brown. Other host plants are ragweed, elder, smartweed, pigweed, horseweed, goldenrod and "brown-eyed susan."

Many adults were collected during May and placed in a cage with a potted *Solidago* plant. July 7, ten eggs were removed from the cage. The eggs were in most cases laid singly and were either placed at the base of the plant or under small lumps of dirt an inch or two from the plant. In one instance eggs were found three inches in the ground and the dead female was found beside them. The eggs are light yellow in color, 1mm. long and 1-30mm. wide. The larvae feed on the roots and hibernate in this stage. By the middle of July few adults could be found in the field. The first appearance of adults is about the middle of May and this seems to hold good for the greater part of the State. The egg stage is about eight days. Twenty-eight larvae were collected May 11 while digging for *Chrysochus* larvae. Larvae under laboratory conditions pupated on top of soil. This was due to the fact that each day they were disturbed so as to get the exact pupa stage. The pupa stage averaged 13.9 days. This insect is very abundant in uncultivated fields and orchards, and along fence rows. Clean cultivation will undoubtedly kill many of the larvae. It is doubtful if this insect will ever become of great economic importance for even with the grape the infestations are in most cases along the outer edge of a vineyard.

## Manuals of Hemiptera in Preparation.

Just now [Feb. 10, 1923] I am busy correcting proof for the *Hemiptera of Connecticut,* so that work should be out within three months. My work on the family Miridae amounts to a revision of the species for the northeastern states. It will merely require additions, and boiling down of descriptions of new species, to complete my work for the *Manual of Hemiptera,* which a half-dozen of us are preparing.—H. H. KNIGHT, University of Minnesota, St. Paul, Minn.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., APRIL, 1923.

## The Number of Living Insects.

We are frequently told that this is the Age of Insects, that there are more species of insects than of all other animals. It is interesting to have, from time to time, the latest figures on the number of insects. Perhaps the most recent census is that of Dr. Anton Handlirsch, who is furnishing the historical, paleontological and systematic parts of the newest German text book —the *Handbuch der Entomologie,* edited by Prof. Dr. Chr. Schröder, of Berlin-Lichterfelde. Dr. Handlirsch's paleontological contribution may be considered as a revised and abridged edition of his *Die Fossilen Insekten,* and we look forward to a review of it in the NEWS from the pen of Prof. T. D. A. Cockerell. Near the close of chapter 7, Paleontologie, 1921, Dr. Handlirsch has a Tabular Review of the Development in Time of the orders and families of insects in past geological periods and in the present. His figures for this last may be summarized as follows:

| Orders | Families | Species | Orders | Families | Species |
|---|---|---|---|---|---|
| Thysanura | 2 | 250 | Corrodentia | 6 | 600 |
| Entotrophi | 3 | 105 | Mallophaga | 2 | 1,350 |
| Protura | 2 | 15 | Siphunculata | 2 | 80 |
| Collembola | 4 | 1,030 | Coleoptera | 98 | (195,000) |
| Ephemerida | 1 | 450 | Strepsiptera | 1 | 150 |
| Odonata | 10 | 2,600 | Hymenoptera | 24 | 67,500 |
| Perlariae | 1 | 480 | Megaloptera | 2 | 100 |
| Embiodea | 1 | 60 | Raphidides | 1 | 40 |
| Saltatoria | 11 | 9,500 | Neuroptera | 6 | 2,000 |
| Phasmida | 5 | 1,900 | Panorpatae | 4 | 163 |
| Dermaptera | 4 | 740 | Trichoptera | 1 | 1,600 |
| Diploglossata | 1 | 2 | Diptera | 40 | 51,000 |
| Thysanoptera | 2 | 500 | Suctoria | 1 | 350 |
| Blattariae | 1 | 2,000 | Lepidoptera | 39 | 92,000 |
| Mantodea | 1 | 1,000 | Heteroptera | 36 | 21,000 |
| Isoptera | 3 | 500 | Homoptera | 11 | 16,000 |
| Zoraptera | 1 | 3 | | | |

Total: 33 orders, 327 families, 470,000 species of living Insects.

## New Names in the Order Lepidoptera.

My attention has recently been called to two homonyms which I published while with Dr. Barnes. Mr. F. H. Benjamin points out that *Oncocnemis punctilinea* B. & L. (Bull. Brook. Ent. Soc. xvii, 71, 1922) is preoccupied by *O. punctilinea* Hampson. I propose the new name ONCOCNEMIS BENJAMINI for this species, in recognition of Mr. Benjamin's excellent work on the Noctuidae.

Through Mr. Charles P. Alexander, I learn that *Nothophila* B. & L. (Bull. Brook. Ent. Soc. xvii, 75, 1922) is preoccupied by *Nothophila* Alexander in Tipulidae, published earlier in 1922. I propose the new name BANDELIA for this genus.

A third item deals with an error in our treatment of *Argus* Scopoli in the Ann. Ent. Soc. Am. xv, 90, 1922. Captain N. D. Riley, of the British Museum, has called Mr. Benjamin's attention to the fact that this name is preoccupied, and that *Satyrodes* will stand.—A. W. LINDSEY, Denison University, Grantville, Ohio.

---

## On the Authorship of the Encyclopédie Méthodique, Vol. IX. A Correction (Lepid.).

In the ENTOMOLOGICAL NEWS for Nov., 1922 (xxxiii, 281-2), I called attention to an apparent mistake in the customary citation of authorship of the species of Lepidoptera described in this work. As has happened many times before, incomplete evidence led to erroneous conclusions. Even in these I was preceded by Sherborn and Woodward, Ann. & Mag. Nat. Hist. (7), xvii, 577-582, 1906. Mr. George Talbot, of the Hill Museum, has kindly brought this reference to my attention, and I am indebted to Dr. Calvert, editor of the NEWS, for supplying me with a summary of its contents.

The paper by Messrs. Sherborn and Woodward is entitled "On the Dates of Publication of the Natural History Portions of the 'Encyclopédie Méthodique'." According to Dr. Calvert's summary, the authors draw from apparently reliable sources evidence that part one of volume nine, including pages 1-328, was published in 1819, while part two, including pages 329-828, did not appear until 1824. In a footnote they express the same erroneous conclusion as my own, in the following words: "9. Mr. Kirby has copies of these two parts as issued. The article 'Papillons' was written by Godart (see the preface to the volume)."

The error in this conclusion and the actual authorship of the species concerned are fully explained in a letter from Dr. Karl Jordan, dated Dec. 12, 1922. Dr. Jordan has brought to my attention another footnote in the Encyclopédie Méthodique which, with the evidence pointed out in my previous note, explains the division of the work on this volume completely. This footnote is on page 706, under the introduction to the "Hespérides", and reads as follows: "Afin d' accélérer le publication de ce demi volume, je me suis chargé de la rédaction de cette tribu des lépidopteres diurnes; j' en excepte seulement le genre *Uranie* et les

*Hespéries d 'Europe.* Latreille." This shows conclusively that Latreille himself described the exotic skippers, and accounts for *Hesperia godart* without reflection on the modesty of his learned collaborator.

In conclusion it may be well to cite Dr. Jordan's summary, which states that the butterflies, *Urania, Castnia, Agarista* and the European Hesperiidae were written up by Godart; the exotic Hesperiidae were handled by Latreille. Certain internal evidence also bears out these points. Dr. Jordan further states that "Kirby and others quote Latreille as the author of the Castnids. It should be Godart. The same applies to '*Agarista Leach*', which is a *Coronidia*."—A. W. Lindsey, Denison University, Granville, Ohio.

---

**Preservation of Rare Species.**

In the *Entomologist* for February, 1923, we note a paragraph by N. D. Riley, "Preservation of rare species," in which he mentions that by a Police Order of 30th June, 1921, certain species of butterflies in Prussia are placed under protection, and comments that it is "a pity no such law exists in this country [England] for the protection of our rare insects

---

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **6**—Journal of the New York Entomological Society. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **20**—Bulletin de la Societe Entomologique de France, Paris. **22**—Bulletin of Entomological Research, London. **41**—Bulletin de la Societe Entomologique Suisse, Bern. **50**—Proceedings of the United States National Museum. **67**—Le Naturaliste Canadien, Quebec. **76**—Nature, London. **89**—Zoologische Jahrbucher, Jena. **90**—The American Naturalist, Lancaster, Pa. **93**—Bulletin, Division of the Natural History Survey, Urbana, Illinois. **124**—Bulletin de la Societe Entomologique d'Egypte, Cairo. **138**—American Museum, Novitates, New York.

**GENERAL.** **Bather, F. A**—The rule of priority in nomenclature. **76,** cxi, 182-3. **Campos, F.**—Estudios sobre la fauna entomologica del Ecuador. IV, Himenopteros. V, Neuropteros. VI-VII, Trichopteros, Euplexopteros. (Rev. Col. Nac. Vicente Rocafuerte, Guayaquil, 1922, iv, 53-78.) **Folsom, J. W.**—Entomology with special reference to its ecological aspects. Rev. Ed. 3. (Philadelphia, P. Blakiston Son & Co., 1922, 502 pp.) **Lizer, C.**—Primer ensayo bibliografico de entomologia Argentina. (Prim. Reun. Nac. Soc. Argentina Cien. Nat., 1916, 321-80.) **McDunnough, J.**—Qu'est-ce que l'entomologie. **67,** xlix, 153-5. **Moreira, C.**—Entomologia agricola Brasileira. (Min. Agr., Indus. e Comm., Rio de Janeiro, Bol. No. 1, 182 pp., 1921.) **Scheerpeltz, O.**—Meine bisherigen erfahrungen mit der schwemm-methode als rationelle sammelweise fur terricole kleintiere. **124,** iii, 8-10, cont. **Wade, J. S.**—On entomological publications of the U. S. Government. **10,** xv, 1-32. **Weiss & West**—The insects and plants of a moist woods on the piedmont plain of New Jersey. **6,** xxx, 169-91.

**ANATOMY, PHYSIOLOGY, ETC.** **Breitenbecher, J. K.**—A red-spotted sex-limited mutation in Bruchus. **90,** lvii, 59-65. **Brocher, F.**—Les trachees inversees. **41,** xiii, 259-61. **Clausen, R. E.**—Inheritance in Drosophila hydei. I. White and vermilion eye-colors. **90,** lvii, 52-58.

**ARACHNIDA AND MYRIOPODA.** **Dempsey, J. H.**—A list of Araneida collected at Concord, Mass. (Proc. Thoreau Mus. Nat. Hist., i, 42-3.)

**THE SMALLER ORDERS OF INSECTA.** **Campos, F.**—Catalogo sistematico y sinonimico de los Odonatos regionales. (Ecuador). (Rev. Col. Nac. Vicente Rocafuerte, Guayaquil, 1922, iv, N. 8, 1-75). **Jorgensen, P.**—Los Tricopteros Argentinos. (Prim. Reun. Nac. Soc. Argentina Cien. Nat., 1916, 389-99.) **Pierson, E. L.**—A list of Odonata collected at Concord, Mass. (Proc. Thoreau Mus. Nat. Hist., i, p. 41.) **Withycombe, C. L.**—The wing venation of Raphidia maculicollis. **9,** lvi, 33-5.

**ORTHOPTERA.** **Caudell, A. N.**—Steiroxys hendersoni, a new katydid. **50,** lxii, Art. 22.

**HEMIPTERA.** **Lizer, C.**—Una nueva subespecie de "Ceroplastes de la Republica Argentina. Sobre una nueva hemipterocecidia Argentina. (Prim. Reun. Nac. Soc. Argentina Cien. Nat., 1916, 381-82; 383-88.) **Williams, C. B.**—A froghopper damaging cacao in Panama. **22,** xiii, 271-4.

**Duncan, C. D.**—The N. Am. species of Phylloxera infesting oak and chestnut. **4,** liv, 267-76.

**LEPIDOPTERA.** **Adkin, R.**—The relative attractiveness of various kinds of light for moths. **9,** lvi, 43-4. **Gable & Baker**—Notes on a migration of Libythea bachmanni. **4,** liv, 265-6. **Glenn, P. A.**

—Codling-moth investigations of the state entomologist's office, 1915-1917. **93,** xiv, 219-89.

**Dyar, H. G.**—The N. Amer. short-winged Psychidae. Note on Cucullia alfarata. A note on Datana perspicua. New American L. **15,** xi, 1-5; 5-7; 10-11; 12-30. **McDunnough, J.**—A new western Catocola. **4,** liv, 288.

**DIPTERA. Aldrich, J. M.**—New genera of two-winged flies of the subfamily Leptogasterinae of the family Asilidae. **50,** lxii, Art. 20. **Bonne-Wepster & Bonne**—A new Megarhinus from Surinam. **15,** xi, 7-9. **Dunn, L. H.**—Observations on the oviposition of the house-fly, Musca domestica, in Panama. **22,** xiii, 301-5. **Johannsen, O. A.**—Stratiomyiid larvae and puparia of the Northeastern states. **6,** xxx, 141-53. **Wille, J.**—Biologische und physiologische beobachtungen und versuche an der kasefliegenlarven (Piophila casei). **39,** xxxix, Zool., 301-20.)

**Curran, C. H.**—New D. in the Canadian Nat. collection. **4,** liv, 277-87. **Dyar, H. G.**—The mosquitoes of the Yellowstone national park. **15,** xi, 36-46. **Kieffer, J. J.**—Diagnose de quelques nouveaux Tanypodines. **20,** 1922, 296-7.

**COLEOPTERA. Wolcott, A. B.**—The male of Cymatodera horni. (Cleridae). **6,** xxx, 191-4. Two new species of West Indian Cleridae. **138,** No. 59. **Sampson, W.**—Notes on the nomenclature of the family Scolytidae. **11,** xi, 269-71. **Hawkins, D. C.**—A list of C. collected at Concord, Mass. (Proc. Thoreau Mus. Nat. Hist., i, 44-47.) **Campos, F.**—Estudios sobre la fauna entomologica del Ecuador. III. Coleopteros. (Rev. Col. Nac. Vicente Rocafuerte, Guayaquil. 1921, No. 6, 24-100.)

**Blackman, M. W.**—Mississippi bark beetles. (Miss. Agr. Exp. Sta., Tech. Bull., 11, 130 pp., 1922.) **Dawson, R. W.**—New species of Serica (Scarabaeidae). V. **6,** xxx, 154-69. **Fall, H. C.**—A review of the North Am. species of Agabus, together with a description of a n. g. and sps. of the tribe of Agabibi. (Mount Vernon, N. Y., J. D. Sherman, Jr., 1922, 36 pp.) A revision of the N. Amer. species of Hydroporus and Agaporus. (Privately printed, Jan., 1923, 129 pp.) **Knaus, W.**—Two new forms of Cicindela with remarks on other forms. **6,** xxx, 194-7.

**HYMENOPTERA. Frisch, K. V.**—Ueber die "sprache" der bienen. **89,** xl., Zool., 1-186. **Forel, A.**—Le monde social des fourmis. Tome I-III (1921-1922). Geneve, Libr. Kundig. **Yuasa, H.**—A classification of the larvae of the Tenthredinoidea. (Illinois Biol. Mon., vii, No. 4.)

**Cockerell, T. D. A.**—Descriptions and records of bees.—XCVII. **11,** xi, 263-8. **MacGullivray, A. D.**—Species of Dolerus from Oregon. **15,** xi, 31-5.

ENTOMOLOGY WITH SPECIAL REFERENCE TO ITS ECOLOGICAL ASPECTS. By JUSTUS WATSON FOLSOM, Sc.D. (Harvard) Assistant Professor of Entomology at the University of Illinois. Third Revised Edition. With five plates and 308 text-figures. Philadelphia, P. Blakiston's Son & Co., 1922. 8 vo., pp. vii, 502.

The two previous editions of this work have been reviewed by the present writer in the NEWS for September, 1906, and for November, 1913, respectively. In the first place cited, this statement was made: "The book seems to us to be excellently adopted as a text-book in zoological courses in which the aim is to understand insects as a whole without laying especial emphasis on the taxonomy, or the special morphology or embryology of any particular group or set of structures. . . ." After sixteen years of additional experience in the class room, he finds himself still holding this opinion, adding that he has never advocated the use of any one book unaccompanied by frequent reference to many other publications dealing with special topics.

The two preceding editions bore the words "Biological and Economic," instead of "Ecological," on the title page* and in conformity with this change is the addition of a new chapter (XIII) "Insect Ecology," pp. 348-409. Its subject headings are:

I. Conditions of Terrestrial Existence. 1. Soil; 2. Atmosphere: Light, Temperature, Pressure, Moisture, Composition, Movement, Electricity, Evaporation; 3. Food Relations; 4. Biotic Conditions.
II. Conditions of Aquatic Existence. 1. Chemical Conditions; 2. Physical Conditions; 3. Food Conditions; 4. Biotic Conditions.
III. Environmental Factors in General.
IV. Classification of Environments.
V. Communities.
VI. Examples of Insect Communities: Grasshoppers [in Michigan after Vestal], Communities of Streams [after Shelford], Community Relations in New Mexico [after J. R. Watson].
VII. Succession.

Lest the general commendation of the book given above be interpreted to cover all its contents, be it remarked in passing that this classification of the subject matter of ecology is not that which seems the most satisfactory.

The typesetting of this third edition is new throughout, although the page form remains the same. There is one additional plate, four additional text-figures, and some other new ones, and 100 more pages than in the second edition. The text, including the copious bibliography (now of 48 pages) at the end thereof, has been extensively revised, so that one notes many omissions, changes and additions in comparison with its immediate predecessor.

The number of classes of Arthropods is raised from 6 to 9 by the

*The *cover* of our copy of the third edition has the old title.

recognition of the Pauropoda, Symphyla and Myrientomata as of that rank. Changes are made in the statements of the characters, and in the sequence, of the Orders of Insects, now numbering 17 by the admission of the Dermaptera, Parasita and Strepsiptera. The Platyptera are retained to include Isoptera, Embioptera, Zoraptera, Corrodentia and Mallophaga as suborders. A number of new paragraphs on the interrelationships of the orders are to be found on pages 22-26. The name Locustidae is accepted for Acrididae and Tettigoniidae for Locustidae ((pp. 62, 63, 92). Interesting statements of the author's present views on the homologies and segmental value of the superlinguae are given on pages 36-37, 44, 81, 133 and 135. Voss' elaborate work on the thoracic muscles of the cricket might have been mentioned on page 78. Much new matter has naturally been incorporated into the chapters on Transmission of Diseases by Insects, Insect Behavior and Insects in Relation to Man. Under geological distribution, pp. 340-347, is no statement of the Australian Triassic Insects or of the actual discoveries at Florissant by Prof. Cockerell.

But who is the entomologist who can write a book on all insects to satisfy all his colleagues?—PHILIP P. CALVERT.

## OBITUARY.

The death of DR. KÁLMÁN KERTÉSZ of Budapest, Hungary, December 28, 1922, has left a regrettable void in the ranks of the World's scientists. His published works in Dipterology are well known and are of the highest quality. For the greater part they are such that the enormous amount of labor involved in their preparation is seldom realized by those benefited, and they stand as unembellished monuments to their deceased author. Dr. Kertész was born January 2, 1867, and so was in the fifty-fifth year of his life. He was Director of the Hungarian National Museum, and a member of several European and American Entomological Societies. Of his more important publications may be mentioned the *Catalogus Dipterorum,* of which seven volumes have been issued, completing the Orthorrhapha and the Cyclorrhapha aschiza (Families Syrphidae, Pipunculidae and Phoridae), leaving the great Schizophora, or Myodaria, still to be published. It is hoped that the manuscript for this latter is available and in shape for publication, or nearly so. At the time of his death he was publishing a contribution towards a monograph of the Stratiomyidae and allies (*Notocantha*). He worked up the Lauxaniidae of the Sauter-Formosa expedition, and also published on this family and the Lonchaeidae of several other faunas, including that of North America. E. T. CRESSON, JR.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXIV — MAY, 1923 — No. 5

CONTENTS



# Studies on Costa Rican Odonata.

## X. Megaloprepus, Its Distribution, Variation, Habits and Food.

By PHILIP P. CALVERT, University of Pennsylvania, Philadelphia, Pa.

*Megaloprepus caerulatus,* of all living Odonata, has the greatest wing-expanse, attaining, at the maximum, 190 mm., while the long and slender abdomen is recorded to reach 102 mm. in the male and 97 mm. in the female. It is an inhabitant of the continental American tropics from the State of Vera Cruz, Mexico, to central Bolivia.

### DISTRIBUTION IN COSTA RICA.

In the *Biologia Centrali-Americana* it was cited from the following localities in Costa Rica: Cachí (misspelled Caché), Carrillo, Santa Clara and finally Quebrada de Java in southern Costa Rica. Dr. Ris[1] has examined specimens from near Tuis

[1]Archiv f. Naturgesch. 82 Jahrg., Abt. A, 9 Heft, S. 65. 1918.

(3 ♂ 4 ♀) and Infernillo (=Juan Viñas) (1 ♂ 1 ♀) at 1000 meters elevation, and from near Orosi (1 ♂ 4 ♀) at 1500 meters, as well as 9 ♂ 1 ♀ without definite locality from that country. The following Costa Rican specimens are before me, taken by myself, except where the name of another collector is specified:

*Atlantic Slope*: Near Guápiles, 300 meters, 980 feet, ♂ No. 1, forest, June 2, 1909. Near Guápiles, 1 ♂ No. 13, July 13, 1915, D. E. Harrower. Florida Road, west of Guápiles, forest, 3 ♂♂, Nos. 2-4, June 3, 1909; 1 ♂ No. 5, 1 ♀ No. 6, June 5, 1909, W. Schaus & J. Barnes; 1 ♂ No. 7, Nov. 18, 1909. Guacimo, ca. 240 meters, banana field, 1 ♀ No. 8, June 7, 1909, Messrs. Stähle & Blair. Peralta. 320 meters, Chiriqui [?] River trail, 1 ♀ No. 9, August 10, 1910. Estrella, below 250 meters, 1 ♂ No. 10, 1 ♀ No. 11, April 22, 1916, C. H. Lankester. Ontario Farm [between the Reventazon and Parismina Rivers], below 100 meters, 1 ♂ No. 12, September 17, 1919, C. H. Lankester.

My field note books contain the following records of this species, although specimens were not taken: Holanda Farm, Agua Buena Creek, November 7, and Rio Banana, forest near the Limon reservoir, November 9, 1909, both localities below 100 meters. Peralta (see above), tropical forest, August 7, 1909. Juan Viñas, bottom of the cañon of the Rio Reventazon, 760 meters, 2500 feet, June 25, 1909; road down the same cañon at above 3000 feet, the highest altitude at which I saw this species, September 29, 1909. In August, 1909, in the Museo Nacional, at San José, I saw a male labeled as taken at Carrillo, July, 1909, by P. Biolley, Jr.[2]

*Pacific Slope*: Near Alajuela, 980 meters, 3200 feet, 1 ♂ No. 14, August 8, and 1 ♂ No. 15, August 12, 1915, D. E. Harrower. Aguacate Mountains [500-1000 meters?], 1 ♂ No. 16, July, 1914, C. H. Lankester.

## Variation.

In 1860, De Selys recognized three "races" of this species: *caerulatus, brevistigma* and *latipennis*.[3] In 1886, having found intermediates between the first and the third of these, only two races were maintained, *caerulatus* and *brevistigma*,[4] and the latest opinion which he expressed,[5] as well as that of Dr. Ris (1918),[6] is to the same effect. In consequence of some corre-

[2] For the localities cited see A. S. and P. P. Calvert, A Year of Costa Rican Natural History, New York, MacMillan Co., 1917.

[3] Bull. Acad. roy. Belg. (2), x, pp. 13-14. [4] Mem. Couron. Acad. Belg. xxxviii, p. 7. [5] Annales Soc. Ent. Belg. xxxiv, Comptes Rendus, p. cxx. 1890.

[6] Dr. Ris, *l. c.*, p. 64, says "Calvert endlich (Biol. C. A. Neur, p. 51, 352—1901, 07) lässt auch *brevistigma* fallen." Nothing is said in the *Biologia* volume about *brevistigma*, but reference *is* made to *latipennis*.

spondence with Prof. T. D. A. Cockerell, who raised the question of the specific distinctness of *brevistigma,* I have examined the Costa Rican material and a few South American specimens referable to, or near to, *brevistigma* in some detail. These latter specimens are:

2 ♂, Nos. 21, 23, 1 ♀ No. 22, head waters of the Rio Carare, (Rio Minero), in woods near the emerald mines of Muzo, Colombia, 2000-5000 feet, Terry Duce, collector, studied by Prof. Cockerell and lent to me by him; 1 ♀ No. 19, "Brésil," from M. René Martin's collection; 1 ♀ No. 20, road to Coroico, Yungaz, Bolivia, April 20, 1899, W. J. Gerhard (the last two in the Academy of Natural Sciences of Philadelphia).

Some of the results of this examination follow.

Length of abdomen ♂: Guápiles 70-103 (5 ♂♂, June) Estrella 91, Ontario Farm 81, Alajuela 86 (2 ♂♂), Rio Carare 80, 99 mm.; ♀: Costa Rica 72-84 (4 ♀♀ listed above), R. Carare 66, Brésil 88, Coroico 90 mm.

Length and maximum width of left hind wing and ratio of the first to the second of these dimensions, ♂: Guápiles (5 ♂♂, June) 59-92 mm., 14-23.5 mm., 3.72-4.21; Estrella 78 mm., 20 mm., 3.9; Ontario Farm 64 mm., 16 mm., 4.0; Alajuela 66, 72 mm., 17, 18.5 mm., 3.88, 3.89; Rio Carare 68, 79 mm., 17 mm., 4.0, 4.65. ♀: Costa Rica (4 ♀♀) 64-73 mm., 17-20 mm., 3.65-3.88. Rio Carare 57 mm., 14 mm., 4.07; Brésil 77 mm., 15.5 mm., 4.97; Coroico 80 mm., 17 mm., 4.71.

Pseudopterostigma, *total* number of cells, *both front* wings, ♂: Guápiles (5 ♂♂, June) 10-6, Estrella 6-8, Ontario Farm 5-6, Alajuela 6-10, Rio Carare 3-11; ♀: Costa Rica (4 ♀♀) 12-17, Rio Carare 10-11, Brésil 4-6, Coroico 6.

Pseudopterostigma, length of costal margin on *left hind* wing, and *total* number of cells *both hind* wings, ♂: Guápiles (5 ♂♂, June) 2.74-4.14 mm., 4-10 cells; Estrella 3.33 mm., 5-6; Ontario Farm 2.96 mm. (4+ -5; Alajuela 2.81, 3.48 mm., 6-10; R. Carare 2.29, 3.18 mm., 2+-9; ♀: Costa Rica (4 ♀♀) 2.96-3.85 mm., 8-12; Rio Carare 2.44 mm., 6-7+; Brésil 2.0 mm., 3-4; Coroico 2.96 mm., 5-6. (These measurements by eye-piece micrometer, Zeiss binocular, oc. 4 obj. *F*55.

Dark band of *front* wings; (*a*) greatest length measured parallel to the costa, position of its proximal edge (*b*) in reference to the point of origin of vein *M2* (nodal sector) in cells and also (*c*) in reference to the fork of *M4* (short sector) in cells. ♂: Guápiles (5 ♂♂, June) *a* 27-19 mm., *b* 3 proximal—3 distal [1], *c* 2 proximal—1 distal; Estrella *a*

[1] This means that in the five males from near Guápiles taken in June, the position of the proximal edge of the dark band of the front wings varied from three cells proximal to the point of origin of *M2* to three cells distal to the same point, and similarly in the other statements.

20 mm., *b* 7 Left 8 Right distal, *c* 7 R 5 L distal; Ontario Farm *a* 21 mm., *b* 5½ L (origin of M2 irregular on the right, *c* 10 R 7 L proximal; Alajuela *a* 17-19 mm., *b* 2-4½ distal, *c* 1 proximal—3 distal; R. Carare *a* 12, 19 mm., *b* 2 R, 3 L, 13 L distal, *c* 3 R, 5 L, 15 L distal. ♀: Costa Rica (4 ♀♀) *a* 15-20 mm., *b* less than 1-7 distal, *c* 1½ proximal—5 distal; R. Carare *a* 16 mm., *b* ½ R 1 L distal, *c* 1½ proximal R, at the fork L; Brésil *a* 12 mm., *b* 7 distal, *c* 11 L, 13 R distal; Coroico *a* 16 mm., *b* 3 R 4 L distal, *c* 11 R 8 L distal.

Ratio of (*d*) the point of origin of *M2* and (*e*) of the fork of *M4* to the length of the *front* wing, ♂: Guápiles (5 ♂♂, June) *d*. .62-.65[a], *e* .68-.69; Estrella *d*. .62, *e* .66; Ontario Farm *d* .71, *e* .74; Alajuela *d* .61, .64, *e* .69, .73; R. Carare *d* .63, .65, *e* .66, .68; ♀: Costa Rica (4 ♀♀) *d* .58-.63, *e* .66-72; R. Carare *d* .62 R .64 L, *e* .70 R .67 L; Brésil *d* .69, *e* .68; Coroico *d* .68 R .67 L, *e* .66. I have also measured the same ratio for M2 in the *left hind* wing and find only a slight difference in the second decimal place from that given for the front wing of each individual.

Distance (*f*) from the nodus to the origin of *M2*, (*g*) from the origin of *M2* to its end on the wing margin, (*h*) *difference between* (*f*) and (*g*), all in millimeters and with reference to the *left hind* wing only, ♂: Guápiles (5 ♂♂, June) *f* 27 to 41, *g* 20.5 to 34.5, *h* 5 to 7.5; Estrella *f* 35, *g* 30, *h* 5; Ontario Farm *f* 30, *g* 21, *h* 9; Alajuela *f* 32, 29, *g* 27, 24.5, *h* 5, 4.5; R. Carare *f* 31, 36.5, *g* 26, 28, *h* 5. 8.5; ♀: Costa Rica (4 ♀♀) *f* 28 to 31, *g* 25 to 29.5, *h* 1. to 4; R. Carare *f* 28, *g* 19, *h* 9; Brésil *f* 39, *g* 25, *h* 14; Coroico *f* 39, *g* 28, *h* 11.

Length of the fork of *Cu* 1 measured from the bifurcation to the end of the distal branch at wing margin, all in millimeters, ♂: Guápiles (5 ♂♂, June) 6-10+ front, 8.5-10+ hind; Estrella 10 + f, h; Ontario Farm 6 f, 9-9.5 h; Alajuela 5 f, 6-11.5 h; R. Carare 4.5-7 f, 3-10 h; ♀: Costa Rica (4 ♀♀) 10+ f (7 in one wing only), 7.5-10+ h; R. Carare 3.5 f, 6.5-7.5 h; Brésil 4-4.5 f, h; Coroico 2 f, 3-5. h (f=front, h=hind wings).

The branches of the fork of *Cu*1 do not extend into the dark band of the wings of the larger ♂ Rio Carare, Brésil ♀, Coroico ♀, nor on the right hind wing of the Aguacate ♂; on the other three wings of this last ♂ only the most distal secondary branch of the fork reaches the band. In all the remaining specimens listed above the branches of the fork extend into the band to a distance varying in different individuals; in some of them the point of bifurcation lies within the band, in others it is proximal to the band.

A milky band is present bordering the proximal margin of the dark band of the wings in ♂♂ Nos. 3, 7, 10, 12, 13, 14, 15, 21; traces of it

[a] This highest ratio is that of the smallest of the five males and the only one of the five in which the proximal edge of the dark band is proximal to the origin of *M2*; the *e* ratio for this same male is .683.

are visible in ♂ No. 1, ♀ ♀ Nos. 8, 9, 22; it is entirely absent in ♂ ♂ Nos. 2, 4, 5, 16, 23, ♀ ♀ Nos. 6, 11, 19, 20. Milkiness distal to the dark band is present in ♂ ♂ Nos. 16, 23, ♀ ♀ Nos. 6, 8, 11, 19, 20, 22[9]; traces of it are visible in ♂ ♂ Nos. 1, 3, 10, 12, 13, 14, 15, 21; it is absent in ♂ ♂ Nos. 2, 4, 5, 7.

Transverse diameter of median ocellus (*i*), maximum diameter of right lateral ocellus (*k*), ♂ : Guápiles (5 ♂ ♂, June) *i* .37-.44, *k* .30-.44; Estrella *i* .39, *k* .37; Ontario Farm *i* .44, *k* .37; Alajuela *i* .37, *k* .37; R. Carare *i* .37, .44; *k* .33, .52; ♀ : Costa Rica (4 ♀ ♀) *i* .36-.44, *k* .30-.44; R. Carare *i* .30, *k* .30; Brésil *i* .44, *k* .41; Coroico *i* .39, *k* .38. All the dimensions are in millimeters by eye-piece micrometer, Zeiss binocular, oc. 4 obj. F55.

These preceding data may be directly compared with those of Dr. Ris (1918) based on a more extensive series of specimens from several other countries in addition to Costa Rica. He has given definitions for distinguishing the races *caerulatus* and *brevistigma* founded on five major characters. An examination of his data on which these definitions are based clearly shows that the one race grades into the other.

The twenty-four Costa Rican examples whose data he gives fall, for the most part, within the two limits of each character assigned to the race *coerulatus;* however, in five of his individuals the fork of *Cu*1 is less than 10 mm. long (in two of the five less than 5 mm.), and in five the ratio of the length to the width of the hind wing exceeds 4.0.

Of the sixteen specimens from Costa Rica discussed in the present paper, 12 out of the total of 32 front wings and 6 out of the 32 hind wings have the fork of *Cu* 1 shorter than 10 mm. Even the smallest individual (♂ No. 4), hind wing 59 mm., has the dark band of the wings 19 mm. wide. Four examples (Nos. 2, 3, 4, 16) have the ratio of length to width, left hind wing, exceeding 4.0 viz.: 4.06, 4.10, 4.21, 4.69, respectively. The extreme range of the difference *h* (see above) is from + 1 (♀ No. 6) to + 9 (♂ No. 12), and of the length of the costal edge of the pseudopterostigma, left hind wing, is from 2.74 (♂ No. 4) to 4.37 (♂ No. 13) mm.

Yet all of these sixteen individuals are to be referred to race *coerulatus;* even ♂ No. 16 whose relatively narrow wings would place it in *brevistigma* is *coerulatus* in the other four characters of Dr. Ris, and the short fork of *Cu*1 (7-8.5 mm. except in the left hind wing where it is 10 mm.) and the short

---

[9] In ♀ No. 9 (Peralta) is no distal milkiness but there are two patches of white veins in its place.

pseudopterostigma of ♂ No. 4 only place it in the intermediate condition between *brevistigma* and *coerulatus,* while its other three characters are those of *coerulatus.*

If we write the individual numbers of the entire twenty-one specimens studied in this paper in the order of their magnitudes, from one extreme to the other for each character, thus

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ♂ | 5 | 3 | 12 | 7 | 13 | 2 | 10 | 4 | 21 | 1 | 14 | 15 | 16 | 23 | ♀ | 8 | 9 | 6 | 11 | 20 | 22 | 19 |
| | 13 | 3 | 5 | 7 | 14 | 2 | 10 | 16 | 21 | 1 | 12 | 15 | 4 | 23 | | 6 | 9 | 8 | 11 | 20 | 22 | 19 |

in which the upper line is for the greatest length of the dark band of the hind wing and the lower line for the length of the costal edge of the pseudopterostigma of the left hind wing, we observe a correlation of these two characters in 8 out of a possible 14 for the males and 5 out of a possible 7 for the females. That these correlations are not exactly correlated with locality may be seen by comparing the individual numbers and their habitats as given on page 130, *anteá, e. g.* ♂ ♂ Nos. 21 and 23, 14 and 15.

It seems hardly useful to occupy more space by giving similar examples of the degree of correlation between other characters studied. Suffice it to say that the maximum number observed for the males is 11 (between the length of the hind wing and the distance from the origin of *M2* to its end) and 7 for the females (*not* for the same pair of characters just given as showing the maximum correlation for the males, but between the length of the hind wing and the distance from either the base of the wing or the nodus to the origin of *M2* and also the length of the abdomen).

For the sake of completeness be it added that of the five non-Costa Rican specimens used for comparison in this paper (page 131 *anteá*) only the Brésil ♀ No. 19 is *brevistigma* by all five of Dr. Ris' characters; then follow in order: ♂ No. 23, ♀ No. 20, ♀ No. 22, ♂ No. 21, the last being more *coerulatus* than *brevistigma.*

De Selys wrote in 1890 *l. c.*: "Le Dr. Hagen me demande encore si le nom de *Meg. caerulatus* (Drury) ne s'applique pas mieux á la race *brevistigma,* Selys, qu'à celle que j'ai considérée comme type de l'espéce et que Drury avait recue de Honduras." He then gave reasons for rejecting this suggested change. The following data, taken from Drury's figure, strengthen de Selys' view:

Abdomen 77, left hind wing 68, its max. width 18 mm., ratio of these latter two 3.77, max. length dark band of front wings, measured parallel to the costa, 20 mm., its proximal edge at 42 mm. from the base on left side on the vein *M1+2* and at 47 mm. on *M4*; no milky bands or spots, costal edge of pseudopterostigma, left hind wing, 3.0

mm. The stigma is shown as crossed by about seven vertical lines on the front wings, by eight oblique lines on the left hind wing and solid on the right hind; fork of *Cu*1 12 (front), 13 (hind) mm. long on the left side, reaching into the dark band on all the wings. In none of the wings is the venation exact, especially at the bases, the right and left wings of each pair are different. In the left hind one long vein, apparently *M*4, is omitted altogether, or perhaps consolidated with *Cu*1. *Cu*1 is shown on both left wings as forking 7 mm. proximad to the proximal edge of the dark band, while on the right wings no fork is shown, unless it be hinted at at the very proximal edge of the dark band. No forking of *M*4 and no origin of *M*2 is shown on any wing.

Drury's description reads: "All the wings are reticulated and transparent, having a broad patch of a deep mazarine blue crossing them near the extremities, the tips being transparent." On comparing the figure in the copy of Drury's *Illustrations* at the Academy of Natural Sciences of Philadelphia with Ridgway's *Color Standards and Color Nomenclature* of 1912, the color of the band on the wings of the former is nearest the "Dusky Violet Blue (2)" of Plate xliii of the latter.

Needham[10] and Tillyard[11] have figured the race *brevistigma,* Munz[12] the race *caerulatus.*

With two slight exceptions, to be mentioned presently, I have found no evidence of any geographical or seasonal variations within the few Costa Rican individuals studied in this paper. The five males, Nos. 1-5, taken near Guápiles, June 2-5, 1909, under nearly uniform environmental conditions, do not form a group by themselves, as compared with the other Costa Rican males. I noted at the time that the three males taken along the Florida road, June 3, 1909, "all in the same mile measure as follows: abdomen 69.5, 86, 91, hind wing 58, 70, 79 mm.," respectively Nos. 4, 2 and 3 of page 130 *anteá.* The characters of male No. 7, taken in the same environment, November 18, 1909, fall, in every case, within the range of the corresponding variations of Nos. 1-5. The two slight exceptions referred to are that the three males, Nos. 14-16, from the Pacific Slope of Costa Rica agree in possessing (1) the minimum length (16-18 mm., 19 mm. in the front wings of No. 14) of the dark band of the wings of all the Costa Rican males, those from the Atlantic Slope having this dimension from 27 to 19 mm., and (2) the difference *h* (see above) is from + 4.5 to + 5. mm.; in this latter respect, while homogeneous, they are not isolated, as the Atlantic Slope males show variations from + 3 to + 9. With the few specimens accessible to me it is impossible to determine the significance of these two exceptions; it should be the subject of future study of more abundant material.

(To be continued)

[10] Proc. U. S. National Mus., xxvi, p. 748, fig. 37. 1903.

[11] Biology of Dragonflies, Cambridge, University Press, pl. i, fig. 8. 1917.

[12] Memoirs Amer. Ent. Soc., pl. viii, fig. 46. 1919.

## Supplementary Note on Megaloprepus (Odon.: Agrionidae).

By T. D. A. Cockerell, Boulder, Colorado.

Last year Mr. Terry Duce sent me several specimens of *Megaloprepus* from the head waters of the Rio Carare (Rio Minero), in woods near the Emerald mines of Muzo, Colombia, at altitudes of 2000-5000 feet. Looking them over, I was surprised to find two very distinct forms, which have been described as *cāerulatus* (Drury) and *brevistigma* (Selys). It seemed to me that they were distinct species, not varieties of one as is commonly supposed, so I wrote out my conclusions and sent the manuscript to Dr. Calvert. This led to a very interesting correspondence, and Dr. Calvert has fully stated his conclusions above. There remain certain speculations not covered in Dr. Calvert's paper, and at his suggestion I give these for what they may be worth. The effort is made to treat the problem as a dynamic one, in the belief that sound judgments concerning evolutionary processes may eventually be attained as the result of establishing a multitude of concurrent probabilities. For this kind of work the insects afford the best material, owing to the vast number of different types available for study.

We do not know the existing biological relationships between *cāerulatus* and *brevistigma*. The available information appears to show that in Colombia they fly together, but probably *brevistigma* does not occur north of Panama. In tabulating the characters of the two forms, confusion is introduced because in certain respects the *brevistigma* female is not so extreme as the male, and its curve is overlapped by that of the *cāerulatus* males. Some characters, such as wing-length, are extremely variable in both forms. I dissected out the penis of a Colombia *brevistigma*, and found it quite like that of *cāerulatus* from the same locality, except that in the latter it was distinctly more slender.

Thus we have a type of Odonata, undoubtedly of great antiquity, which presents very few forms, so close as to be regarded as races of a single species. We might expect such

an organism to be very constant in its characters, but instead it is extremely variable. The variations are of such a nature that they cannot in any large part be attributed to the direct effects of environment, and hence we must assume that the insects are strongly heterozygous in their composition. We have no evidence that *cāerulatus* and *brevistigma* cross, but also no grounds for believing that this is impossible. It seems entirely possible that in the comparatively recent times when the Isthmus of Panama was under water, *cāerulatus* was the Central American species, and *brevistigma* that of the Andean region of South America. Existing thus isolated, they may have developed their special characters. Since it became possible to cross from one region to the other, each may have invaded the other's territory, and hybridisation may have occurred, producing an epidemic of variation. But *brevistigma,* having a large range in the Andean region, has remained in part unmodified, though its territory is gradually being overrun by *cāerulatus* from the north. Eventually, especially in the valleys of the Andes, homozygous combinations may be sorted out giving rise to a series of closely allied races or species, as may be seen in numerous genera of butterflies and birds of the same region. Whether this is now in process, can only be determined by elaborate statistical studies of materials yet to be gathered.

A very instructive case for comparison with that of *Megaloprepus* is that of *Steganura,* a genus of African birds, discussed by Mr. J. P. Chapin in *American Museum Novitates,* No. 43 (1922). *S. aucupum* has been considered a subspecies of *S. paradisaea,* but Chapin believes that it is distinct. He supposes that when the equatorial forest was more extensive, *S. aucupum* was restricted to the grasslands north of it, *S. paradisaea* to the south. These birds have now invaded each others territory, and were held by students to be forms of a single variable species. The females cannot be separated with any confidence, but the males in "eclipse plumage" are readily distinguished. Chapin thinks that they do not interbreed, but has no exact information on this point.

# A New Genus and Species of Sphinx (Lepid.).

By HENRY SKINNER, The Academy of Natural Sciences of Philadelphia.

**KLONEUS**, new genus.

Allied to *Pachysphinx* R. and J. Female. Antennae on the upperside clothed with coarse yellow hairs and on the sides and beneath with light brown, velvety pile. Eyes large, 5 mm. in diameter. Palpi large and greatly swollen above and square at the lower end. Thorax unicolorous. Primary wings scalloped as in *Pachysphinx* and the wings of the same shape, widening as the outer margin is approached. Secondaries also scalloped and not entire as in *Pachysphinx*.

*Type—Kloneus babayaga* n. sp.

**Kloneus babayaga**, n. sp.

♀.—Upperside. Primaries brown with a curved dark brown band near the apex of the wing; a round spot near the middle of the same color, 4 mm. in diameter; a small dark brown spot at base and a large spot on inferior margin, extending 8 mm. into the wing. Secondaries brown with a dark brown fascia on outer margin 9 mm. wide at top and 3.5 wide at anal angle; inside and parallel to this is a dark brown line.

Underside considerably lighter in color and the primaries and secondaries have two parallel lines crossing from the costa to the inner margin, 9 mm. apart. Expanse of one primary wing 55 mm. and of one secondary 37 mm.

Thorax, abdomen and wings concolorous.

*Locality,* Eden Mine, Nicaragua, June 13th. 1922, J. S. McKenzie.

*Type* in the collection of The Academy of Natural Sciences of Philadelphia.

## Insecta Part of the Zoological Record for 1922.

The attention of Entomologists throughout the world is called to the fact that, beginning with the Volume for 1922, the preparation of the "Insecta" part of the "Zoological Record," is being undertaken by the Imperial Bureau of Entomology. In order that the Record may be as complete as it is possible to make it, all authors of entomological papers, especially of systematic ones, are requested to send separata of their papers to the Bureau. These are particularly desired in cases where the original journal is one that is not primarily devoted to entomology. All separata should be addressed to The Assistant Director, Imperial Bureau of Entomology, 41, Queen's Gate, London, S. W. 7, England.

# The Cordylurid Genus Paralleloma and its Nearest Allies (Dipt.).

By J. R. Malloch, U. S. Bureau of Biological Survey, Washington, D. C.

This paper deals with North American species only. The genus *Paralleloma* was erected by Becker for the reception of the species previously placed in the genus *Cordylura* which have the thoracic dorsocentral bristles reduced or almost absent. I recently published, in my paper on the Diptera collected by the Canadian Arctic Expedition, a key to the genera of Scatophagidae in which I cited characters for the differentiation of all the genera then known to me as occurring in America. In the present paper I have proposed a subdivision of the genus *Paralleloma*, which adds two genera to our list, though the species cited as genotypes are among those already known to science.

## AMERICINA gen. n.

Differs from *Paralleloma* in having the arista pubescent, prealar bristle absent, posterior notopleural generally present, and the sixth wing-vein traceable to margin of wing though very indistinctly so.

Genotype, *Cordylura adusta* Loew.

**Americina adusta** (Loew)

The specimens which I have examined are all similarly colored. Shining whitish yellow, black on upper half of occiput, ocellar spot, apex of third antennal segment, broadly on each side of mesonotum and scutellum, on dorsum of mesonotum a longitudinal stripe below and behind base of wings, and the entire abdomen. All tarsi blackened. Wings slightly infuscated at apices.

The posterior notopleural bristle in one male is duplicated. Scutellum longer than in any allied species, slightly flattened on disc, and almost triangular, with 4 bristles, the basal pair shortest. The short stout bristles on ventral surface of mid femur in male distinguish this species from any of its allies.

Originally described from New Jersey and since recorded from New Hampshire. I have taken it in Illinois and seen specimens from Maryland, near Plummers Island (McAtee). and Indiana (Aldrich).

**Americina inermis** (Loew).

Differs from the preceding species in having the antennae entirely yellow, the dorsum of thorax, scutellum and metanotum black, and the wings clear.

The scutellum is short, with two very long lateral bristles and two minute apical hairs, the legs are entirely without strong bristles, and the tarsi are pale.

Originally described from the White Mountains, New Hampshire. I have seen one male from Viola, Idaho. Cresson has redescribed this species from the northwest as *Cordilura nudicornis*.

**ACHAETELLA** gen. n.

Differs from *Paralleloma* and *Americina* in having postvertical bristles absent. The sixth wing-vein is continued rather distinctly to the margin, the prealar bristle is present as is generally also the posterior notopleural.

Genotype, *Lissa varipes* Walker.

**Achaetella varipes** (Walker).

The black body, conspicuously marked black and yellow legs, and black tipped wings of this species distinguish it from any other in the group.

Originally described from Ohio. Since recorded from New Jersey, Wisconsin, Illinois and Montreal, Canada. It is very common and generally distributed in Illinois and the Atlantic States as far south as District of Columbia.

(To be contiuned)

# The Life History of Hesperia ericetorum Boisd. (Lepid. : Hesperiidae).

By KARL R. COOLIDGE, Hollywood, California.

*Hesperia ericetorum* has been recorded from California, New Mexico, Arizona, Colorado and Oregon, and recently Mr. Erval J. Newcomer has written me that the species occurs quite commonly about Yakima, Washington.

It is a fairly abundant butterfly in Southern California, but though possessing a strong flight, is only rarely found at any distance from the vicinity of its food-plants, and for this reason it has sometimes been considered as being quite scarce. About Los Angeles I have found *ericetorum* on the wing practically

every month of the year, and while the various broods so overlap that I have not found it convenient to draw definite sharp lines of distinction between them, my records of the past ten years indicate that there are at least six broods, issuing as follows:

A first brood as early as the first week in February, but only in scanty numbers. On the Colorado Desert, however, the first brood is much more numerous and its members appear as soon as the last week in December. About Los Angeles fresh specimens are again in evidence in late March and early April, while a third brood appears during the first two weeks of June. Again, from the middle of July on another brood comes forth, and the last of September finds a fifth, which in point of numbers, is the largest brood of the season. Then from the first to the middle of October a final brood appears, and after the first week of November until February, specimens are only rarely seen. In all the broods the males appear a week or more prior to the emergence of the females.

Naturally, in the mountainous regions, the broods are more restricted, probably to two or three at an elevation of five thousand feet, and in the still higher ranges limited to a single brood. Mr. Newcomer writes me that in Washington it is double-brooded, appearing in June and in August, with the latter brood much the larger.

Of the life history of *ericetorum* nothing has been recorded except the very brief reference by W. G. Wright (Butt. West Coast) stating that the food-plant is *Malvastrum thurberi*, and that "The egg is white, globular, and laid on the young leaves."

The following food-plants are known to me:

MALVACEAE.

*Malvastrum* sp.—About Los Angeles commonly on *M. fasiculatum* (Nutt.) Greene, (=*thurberi* Gray), popularly known as "False Mallow" and typically at home in the lower altitudes of the chaparral belt. Other species of *Malvastrum* here upon which I have found eggs or larvae are *M. orbiculatum* Greene and *M. davidsonii* Robinson. On the Mohave Desert the usual food-plant is *M. exile* Gray, while on the Colorado Desert, about the Salton Sea, I have taken larvae from the showy "Five Spot" or "Spotted Mallow," *M. rotundifolium.*

*Sphaeralcea ambigua* Gray.—Desert Mallow. The common food-plant on the Colorado Desert. In the vicinity of Indio and the Salton Sink I have also obtained larvae from *S. angustifolia* var. *cuspidata.*

*Malva borealis* Linn.—Cheeseweed, an introduction from Europe. A single specimen bred from this at Los Angeles. *H. tessellata occidentalis* Skinner, which breeds here on *M. borealis,* is also occasionally found on the species of *Malvastrum.*

*Althea.*—Hollyhock. Mr. Newcomer has sent me specimens bred from this in Washington.

AMARANTHACEAE.

*Amaranthus bilitoides* Wats.—Pigweed. Mr. Newcomer writes me that he has found the larva on this at Yakima, Washington.

In ovipositing the female seems to prefer the just unfolding young leaves, often tucking the egg in so nicely on the upper surface that it is well hidden from view. But again the egg may be placed on the under surface of the leaves, and even occasionally on the stem.

The egg period varies, but on the average is twelve days. So also there is variation in the duration of the various instars, but on the whole these stages average about fourteen days, and from oviposition to the emergence of the adult a period of seventy-five to eighty days, though in the hot summer months this is greatly shortened.

There is nothing new or of special interest in the behavior of the larvae. The newly hatched larva spins only a few weak, loose strands on the upper surface of the leaf, biting out small irregular holes, and resting in a coiled position. In the second instar the larva spins a rather heavy matting of silk, on which it rests, eating out roundish holes in the leaf. I observed no larvae in the second instar forming regular nests.

But after the second moult the larva builds itself the usual type of nest, forming larger ones as it increases in size, and in every instance under observation pupation occurred within the nest of the final instar, the cremaster being weakly thrust into a small button of silk.

*The Egg.*—In shape sub-spherical, the base sharply flattened, thence swelling out roundly to the greatest width, in the middle of the lower fourth of the egg.

Traversed by a series of fairly straight but weak longitudinal ribs these are .03 mm. equidistant, with the walls about .001 mm. in thick

ness. Running transversely, a series of similar ribs, but scarcel lower than the longitudinal and forming with them, for the most par regular quadrate cells, .04 mm. in diameter. From the angles formed by these series of ribs arise blunt spines, .03 mm. in height, .01 mm. in thickness, and inclining apically.

The longitudinal ribs mostly extend to the micropyle, terminating there abruptly, but some coalesce with adjacent ribs before the summit is reached. The micropyle in a rather deep circular depression, .18 mm. in diameter.

Height, .68 mm. Diameter at base, .76 mm. Greatest diameter, .92 mm. Color, when first laid, a pale lemon yellow, soon assuming a nacreous reflection, and in a day or two becoming chalky white.

*Larva.*—The young larva escapes by eating out a jagged hole in the micropylar region, about .50 mm. in diameter, and does not devour the egg shell.

*First Instar.*—Body quite even, tapering but slightly posteriorly. Each segment with four, fine, transverse creases.

Head shining black, .48 mm. in diameter. A few, fine, scattered, colorless hairs on head, the longest of these .17 mm. in length. Collar .40 mm. in width, castaneous; the dorsal shield black. Two transverse series of colorless hairs, .16 mm. in length, on the collar.

On the body a number of series of rather high conical pale yellow tubercles, .02 mm. in height and diameter at base, from which project colorless forked hairs in the following series:

A subdorsal row, situated just a little anterior of middle. A laterodorsal row, situated just posterior to middle. A substigmatal central row. The subdorsal hairs project in a straight stem to a distance of .03 mm., where the branch occurs, the posterior branch bending roundly posteriorly, the anterior branch roundly anteriorly; these branches .07 mm. in length, with the stem at base .005 mm. in diameter. The laterodorsal hairs are much smaller, being only .07 mm. in their entire length.

Below the substigmatal row are two, straight, sharp hairs per segment, the anterior one projecting slightly anteriorly, the posterior one bent slightly posteriorly; the posterior hair slightly the longer, .09 mm. in length, while the anterior one is .07 mm. Both hairs are colorless and minutely spiculiferous.

Spiracles pallid, round, .02 mm. in diameter. Anal segment with a few long colorless hairs, projecting posteriorly, .23 mm. in length.

Color of body very pale lemon yellow, with a whitish sheen. Legs very pale gray brown, tipped with black. Prolegs and ventral surface pale lemon yellow.

Length 1.92 mm. Width at first thoracic segment .38 mm. Width at anal segment .28 mm. Height at first thoracic segment .52 mm.

*Second Instar.*—Body quite uniform, but tapering slightly and evenly posteriorly. Each segment with four, fine, but distinct, creases.

Head black, .84 mm. in diameter; mandibles reddish. Median suture of head rather deep and wide and the head is now very roughly corrugated, densely clothed with rather heavy, blunt and more or less crooked, white hairs, .08 mm. in length on the average. Collar .76 mm. in diameter, dark chestnut brown, the hairs on it white, .08 mm. in length, straight, stout, broken at the tips into four or five sharp prongs. These hairs are in a double row, and in addition there are some scattered similar hairs, very much smaller, .03 mm. in length.

The body now studded with bulbous white papillae, .02 mm. in height and of the same diameter at base, from which project colorless straight and rather thick hairs, .04 mm. in height, broken at the summit into four or five sharp prongs. These bulbous papillae arranged in five, even, regular, vertical rows.

A substigmatal fringe of colorless long, sharp hairs, originating in bulbous papillae; these hairs .18 mm. in length, two to a segment, one anterior, one posterior. Anal segment with a fringe of similar hairs. Spiracles oval, .04 mm. in length, with a heavy white border.

Color of body pale greenish yellow. Legs shining black, tipped with red brown. Prolegs and ventral surface pale yellowish.

Length 4.4 mm. Width at first thoracic .80 mm. Width at anal segment .64 mm.

*Third Instar.*—Body as before, the white pronged hairs arising from the bulbous tubercles now .12 mm. in length. The bulbous tubercles greenish yellow, .04 mm. in height. The substigmatal sharp hairs .20 mm. in length.

Head 1.2 mm. in diameter, black, roughly corrugated, heavily clothed with pronged white hairs, .08 mm. in length on the average; some similar smaller ones, .04 mm. in length. Collar 1.08 mm. in diameter, with its white pronged hairs .16 mm. in length.

Spiracles pallid, .02 mm. in diameter. Anal segment with a fringe of sharp colorless hairs.

Color of body pale greenish yellow. Legs pale brown, shining, fuscous at tips. Prolegs and ventral surface pale lemon yellow.

Length 7. mm. Width at first thoracic 1.06 mm. Width at anal segment .80 mm.

*Fourth Instar.*—Body as before, the pronged white hairs arising from the bulbous tubercles .14 mm. in their greatest length, some as short as .10 mm. The white, bulbous papillae mostly .06 mm. in height, but varying considerably. The sharp, substigmatal hairs .30 mm. in length.

Head 1.44 mm. in diameter, black, densely clothed with irregular, filament-like, branching hairs, white, almost completely obscuring the black ground color; these hairs about .1 mm. in length on the average. Collar 1.26 mm. in diameter, black, with its pronged white hairs .18 mm. in length. Spiracles pallid, .03 mm. in diameter.

Color of body pale greenish yellow. Legs pale brown, shining, dark brown at tips. Prolegs and ventral surface pale lemon yellow.

Length 12. mm. Width at first thoracic 1.24 mm. Width at anal segment 1. mm.

*Fifth Instar.*—Body as before, the colorless, bulbous papillae .06 mm. in height, .04 mm. in diameter; the white hairs arising from these truncate and sharply pronged, projecting to an average height of .12 mm. and .03 mm. in diameter at the summit; the largest of these hairs run to .20 mm. in length. Surface of body finely granulated. Segmental incisures sharply defined, green.

Head 2.90 mm. in diameter, black, rugose, densely clothed with filament-like, branching hairs, white; these hairs are irregular in length, about .5 mm. on the average and by their density almost completely obscure the black ground coloration. Collar sordid white, the fringe of colorless, truncated, pronged hairs on it averaging .34 mm. in length. Spiracles oval, .1 mm. in length.

Color of body pale yellowish green. A narrow, green, dorsal line. A laterodorsal, greenish stripe, indistinct, edged below with an equally indistinct, crenate, pale yellowish line. A substigmatal pale yellowish band. As the stage develops the larva assumes a more and more pale salmon tinting, in some cases quite obliterating the greenish ground color, and the bands become pale pinkish. Legs pale yellow, fuscous at the tips. Ventral surface and prolegs pale green.

Length 27. mm. Width at first thoracic 4. mm. Width at anal segment 2.3 mm.

*The Pupa.*—Densely covered with a bright bluish dusting, which, however, is easily dissipated. After this bluish dusting has been removed the thorax and the wing cases are yellow mahogany, the wing cases clear and shining. Abdominal segments dull pinkish. Eyes prominent, of a slightly deeper tone of coloration. Cremaster dull black, tipped with reddish.

Rather densely clothed, except on the wing cases, and especially on the abdominal segments, with strong, sharp, pointed hairs, of varying lengths; the largest .54 mm. in length, then shorter ones to .20 mm. These, for the most part, are colorless, but some, especially those on the thorax, are tinged with reddish. The tubercles from which these hairs arise very low, hardly perceptible.

Head case with five distinct patches of hairs, .60 mm. in length quite uniformly. Tubercles by eyes prominent, elevated, black. Spiracles oval, .19 mm. in length, with a fine fuscous ring.

On thorax a fine dorsal line, not observable when the bloom is removed, terminating a little posterior to middle in a short transverse band, more specifically two, more or less connected, quadrate spots; below these, at a distance of nearly 1 mm., two more similar spots, from which the fine dorsal line is continued. On either side of the dorsal line an inconspicuous row of dark points in a semi-circle.

Abdominal segments dorsally with a series of eight, rounded or subquadrate, dark points in a transverse row, not at all prominent until the bloom is removed; these spots of quite uniform size, but the two central ones are always the largest.

Length 16 mm. Width at eyes 4. mm. Width in middle of thorax 4.75 mm. Length of cremaster 1.4 mm; width of cremaster at tip .34 mm.

# The Genus Pseudogarypus Ellingsen (Pseudoscorpionida-Feaellidae).

By JOSEPH CONRAD CHAMBERLIN, Stanford University, California.

## INTRODUCTORY.

Due to its many unusual characters and its unusual systematic position the genus *Pseudogarypus* is possessed of more than ordinary interest to the student of the Chelonethi. So far as known it comprises but a single known species and since this species has so far been but inadequately treated, it has been thought well worth while to go into as great detail as possible in the following treatise. Since my material consists of but a single adult male specimen, it is obvious that in a number of respects this work must be incomplete, but nevertheless a great many facts and characters have been carefully worked out and it has been thought best to present this evidence at this time rather than to await the discovery of more material. The female should prove particularly interesting.

My thanks are due Prof. G. F. Ferris for his everwilling aid and advice. To Dr. R. V. Chamberlin, of Cambridge, I am indebted for the specimen upon which this paper is based.

## HISTORICAL REMARKS.

*Pseudogarypus bicornis* was first described by Nathan Banks in 1895 from specimens collected in the Yellowstone National Park. While realizing some of its unusual features and remarking that it would possibly fall in a group generically distinct from *Garypus,* the genus to which he referred it, he did not bring out its distinctive features at all clearly and hence the species was practically lost sight of for many years. With, in his excellent paper of 1906, fully realized some of its unusual

features and commented that a new genus would probably be necessary for its reception. Finally, in 1909, Ellingsen, who had received a single specimen from Shasta Springs, California, erected a new genus for its reception which he called *Pseudogarypus*. He gave no figures and did not discuss it in any detail so that is has never aroused the interest to which its unusual features and characters entitle it.

### DETERMINATION.

There are several discrepancies between Banks' description and my specimen but these are, I am convinced, due to Banks' misinterpreting some of the characters of his specimen rather than to any valid difference. As Ellingsen remarked in his paper, "I have no doubt that the animal I have before me belongs to the same species described by Nathan Banks in spite of one or two differences between Banks' description and my animal." That this determination is probably correct is further enhanced by the geographical proximity of Bear Lake, Utah, where my specimen was collected, to the Yellowstone National Park, the type locality of the species. The close coincidence in measurements between my specimen and the measurements ot the species as given by Ellingsen, make it seem very nearly certain that Ellingsen's specimen is also conspecific with mine.

### SYSTEMATIC AND MORPHOLOGICAL SECTION.

#### FEAELLIDAE Ellingsen.

1906—Feaellidae Ellingsen, Ann. Mus. Civ. Stor. nat. Genova. (3): II: 260-263: IV.

1906—Feaellidae Ellingsen, With, D. kgl. Dansk. Vid. Selsk. Skrift. 7. Række, nat. og. math. Afd. III: 58.

1908—Feaellidae Ellingsen, With, Særtryk af Vidensk. Meddel. fra den naturh. Form. Copenhagen. 8-12: I figs. 1-10.

*Diagnosis—All tarsi single-segmented; tarsi always longer than tibiae; all femora divided into a pars basalis and pars tibialis by a freely movable ginglymous articulation; eleventh tergite and tenth (eleventh?) sternite fused into a single ventral shield which bears centrally the anal opening which is provided with a bi-partite operculum; with four eyes.*

*Remarks*—The above characters will include the only two known genera of the family. Ellingsen, in his paper of 1909

(on *Pseudogarypus*), does not make it clear whether or not he considered *Pseudogarypus* as falling into the Feaellidae or not. He rather noncommittally states that it will stand more or less between *Feaella* and *Garypus*. While the differences between the genera are considerable, the resemblances are likewise numerous and consequently it is my opinion that the two genera will fall into the same family. The most striking difference is in the pleural abdominal plates of *Feaella*, but since *Pseudogarypus* possesses a well-defined cephalothoracic pleural plate even this difference is not as great as it may seem. However, I think there is no doubt that the two genera are representatives of two distinct sub-families.

As to the relationship of the family as a whole I am not at present competent to speak. As a purely tentative opinion I think that there is considerably more resemblance to the *Chthoniids* and especially the *Obisiids* than the leg structure warrants me to believe. However, the single-segmented tarsi are not too great a barrier, since their elongate structure gives some reason for thinking that this may be due to a secondary fusion of an originally two-segmented condition. This same feature is exemplified in the Chthoniidae where we find elongate fore tarsi which are single-segmented, while the hind tarsi are of the typical two-segmented structure of the *Obisiidae, Garypidae,* etc. My conclusion is based to a great extent on the structure of the male genitalia, which strikingly resemble in several respects those of the *Chthoniid-Obisiid* group of genera. For example, the remarkable genital sacs here figured for *Pseudogarypus* are almost duplicated in *Garypinus* (Chamberlin, 1923) and the two crescent-shaped posterior chitinous portions which bear the setae (Fig. 14-b) find their counterpart in both the *Chthoniids* and certain of the *Obisiids*.

FEAELLINAE Ellingsen.

*Diagnosis—With a well developed ginglymous articulation between the cephalothorax and the abdomen; apparently without a distinct cephalothoracic pleural plate; with a dorsal lateral row of fifteen small pleural plates and a similar row of fourteen ventral pleural plates; carapace bearing along its anterior*

*margin a double row of prominent bulges or rather tuberculate processes; palpi of a distinctly aberrant type, not shaped at all as in Garypus but approaching to some extent those of the Chthoniidae.*

For further information concerning this sub-family see the references listed under the family heading, all of which concern this sub-family only. So far three species have been described in the genus *Feaella,* two from Africa (*mirabilis* from Portuguese Guinea; *mucronata* from Natal) and one (*affinis*) from the Seychelles Islands.

(To be continued)

## A New Species of the Genus Buenoa (Hemiptera, Notonectidae).

By H. B. Hungerford, Lawrence, Kansas.

During August of 1922, under the auspices of the Entomological Survey of Minnesota, Doctor Harry Knight, Mr. Wm. E. Hoffmann and the writer made a 1200-mile collecting trip through Minnesota. Special attention was given to the aquatic insects of this region of innumerable lakes and ponds, A portion of the journey was along the north shore of Lake Superior to Grand Marias. North of Grand Marias and some fifteen miles from the lake, we camped by a large beaver pond. This pond occupies a basin hemmed in against a high hill by a meandering glacial eskar. This high and well-defined ridge, after running for some distance parallel with the hill, makes a wide crescentic curve to the hill, thus disputing the right of way with the drainage between hill and eskar. A stream had cut a narrow gap of a few rods through the eskar, and at this strategic place, the incomparable rodent engineers have built a high dam, forming a pond that is at least eight feet deep in spots and covers several acres.

Here and there stand stark trees, killed when the water encompassed them, and piles of drift brush lodged in time of freshet. The water is stained therefore with the amber color characteristic of such places. This first dip of the writer's net brought up two specimens of a beautiful new species of back-

swimmer. Diligent collecting by Mr. Hoffmann and the writer secured a splendid series of this most striking and distinct North American *Buenoa.*

The apparent isolation of this insect and our failure to collect it elsewhere in our rather careful search for aquatic Hemiptera, is worthy of note. Like the others of its genus, it swims submerged, and its body is richly supplied with the blood-red oxyhaemoglobin-bearing cells. It, like the smaller *B. elegans* Fieb., swims in the shallow, protected waters along shore, differing thus from *B. margaritacea,* which prefers the deeper water.

**Buenoa limnocastoris** species new.

*Size*: Length, 6.25 mm. to 7 mm.; width across the eyes in largest female, 1.3 mm.; greatest body width, 2 mm. The males are more slender, the head being fully as wide as greatest body width, the average being about 1.2 mm. for head width.

*Color*: The living insects are very striking in their pattern of black and white, the limbs and underside of body deep mahogany. The prothorax is whitish with a smoky to black patch on either side above the margin; scutellum colorless; elytra whitish with shining black band covering humeral angle and extending along the anterior margin of wing for about one-third of its length, another large, triangular, black spot at tip of corium, extending across the wing; propleura of prothorax black, opaque; parapleural plates black, save a yellow patch along ventral margin; longitudinal dark area on sides of thorax visible through the transparent wings; the abdominal segments immediately beneath the corial black patches, black; abdominal venter blackish in dead specimens; median longitudinal black stripe on beak, all the tibiae and hind femora. In life the rich red of the oxyhaemoglobin within the abdomen, shows through the sides of abdomen and makes the venter dark mahogany.

*Shape*: The eyes are protuberant and prothorax narrow, markedly narrower than the head in both sexes, and impressed with two longitudinal depressions more or less distinct. The pronotum of the male inflated, and in dead specimens the disc stands up as a transparent, elongate, heart-shaped area, divided longitudinally by the median carina Scutellum reduced, narrow, elevated, but depressed near its front margin by a deep transverse groove.

*Structural Peculiarities*: Tylus prominent, more prominent in male than female. Synthlipsis narrower in male than in female in which it is less than half the vertex. In cephalic view the inner margin of eyes parallel.

Pronotum faintly tricarinate in the female, more distinct in the male; in lateral view the pronotum of the male is strongly arched and inflated, the lateral margins prominent and distinctly ledged, the lateral areas beneath the ledge depressed. Scutellum reduced in both sexes, relatively larger in female than in male; in the female, scutellum two-thirds length of pronotum and a little less than one-third length of elytral suture; in the male scutellum is not more than one-half length of pronotum and less than one-third length of elytral suture. Claval orifice just behind tip of scutellum, two-thirds the length of scutellum in both sexes. Surface of elytra rastrate and pebbled, especially in the black areas; the dark sides of pronotum above the ledge sparsely rastrate, also the upper half of parapleural plates.

Front femora greatly swollen in male and somewhat thickened in female. Front tibiae flattened in both sexes, broader at base in male and bent along its long axis; tarsi two-segmented in both sexes. Middle femora slender, angulate; tibiae flattened, not quite attaining distal end of trochanter when limb is flexed; tarsi two-segmented, segment one not quite a third longer than two; tarsal claws about one-third length of distal tarsal segment in male, claws more developed in female, about one-half distal segment; front and middle limbs equipped with strong, mobile setae. Hind limbs flattened and fringed, tibia one-seventh shorter than the femur; hind tarsi two-segmented, segments subequal in length, tarsus about one-fifth shorter than hind tibia.

Described from a long series taken near Maple Hill, Cook County, Minnesota. *Holotype* in University of Minnesota collection, *allotype* in University of Kansas collection, *paratypes* in University of Minnesota, U. S. National Museum and following private collections: W. E. Hoffmann, J. R. de la Torre Bueno, R. F. Hussey, Dr. Carl Drake, Dr. H. M. Parshley and that of the writer.

NOTES: This species is quite unrelated to the *Buenoa margaritacea-platycnemis* series, which have orange in their coloring and are very compactly formed creatures. Furthermore, each of the above species has a head that fits firmly against the short pronotum, a large scutellum as long as the pronotum at least, and very broad; and in them, the elytral orifice is less than one-third the length of the scutellum, which is more than one-half the elytral suture.

The new species is much more nearly related to what we know as *B. elegans* Fieb. This latter species I have taken in large numbers in what is known as "Stubbs Pond," near Law-

rence, Kansas. *B. elegans* Fieb. is considerably smaller, however, and structurally distinct. The new species has, in general, the same coloring—black and white. The humeral and corial black spots are the same. The black stripe on sides of thorax in *B. elegans* Fieb. is more prominent, but in all of my specimens, the pronotal lateral spots are lacking. I have specimens of this smaller species which lack all black markings.

In structure, the two species are quite distinct: the eyes of *B. elegans* are closer together; in males the synthlipsis very narrow, eyes almost touching; the pronotum is not arched and scutellum is much larger. In the male the scutellum is three-fourths as long as pronotum, more than twice as long as elytral orifice and one-third as long as elytral suture; in the female the scutellum is relatively larger, being as long as pronotum. In side view the difference between these two species is especially well marked in the males. *B. limnocastoris* has front femora more strongly incrassate and pronotum arched. Furthermore, the male genitalia show them to be distinct.

## Notes on Two Species of Lepidoptera Described by Guenée (Noctuidae, Geometridae).

**Acronycta clarescens** Gn.

1852, Gn., Spec. Gén., V, Noct., I, 54, *Acronycta.*

M. C. Oberthür, *Études de Lépidoptérologie Comparée*, XVII, 21, states: "L'étiquette écrite par Guenée, auteur toujours extremement sincère, est ainsi conçue: 'Je ne me rapelle pas si cet individu a servi á ma description, mais j'ai tout lieu de le croire.'" On plate DV, fig. 4217 this specimen is shown. In view of the fact that M. Guenée appeared to be in doubt whether this specimen served for his description or not and the fact that there is a specimen labeled "type" in the British Museum, which corresponds to *A. clarescens* in the sense used by Hampson and later authors and where the Doubleday specimens described by Guenée should be, the present authors are led to disagree with Dr. McDunnough, who placed *pruni* Harris synonomous, in a recent paper—(1922 Ent. News., xxxiii, 228).

With doubt cast upon the authenticity of M. Oberthür's type by M. Guenée himself, there seems to be no other course available than to accept the type in the British Museum as representing the species. The synonomy in the Check List (B. & McD., 1917) will stand unaltered.

**Xanthorhoe defensaria** Gn.

1851, Gn., Spec. Gén., X., 411, *Coremia.*

1920, Oberthür, Etud. Lepid. Comp., XVII, 23, (pl. DVII, f. 4240, Fig. type?, *convallaria?, guenéeata?*) *Coremia.*

1922, McD., Ent. News, XXXIII, 229, *Coremia.*

Dr. McDunnough, evidently not seeing the text of the *Études,* states that M. Oberthür's figure cannot represent the type of *defensaria* and "represents a specimen of *Perizoma polygrammata,* Hlst. or one of its close allies."

The species figured by M. Oberthür is probably *Perizoma custodiata,* Gn=*guenéeata* Pack.

Wm. Barnes and F. H. Benjamin, Decatur, Illinois.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., MAY, 1923.

### Those Unlabeled Figures.

A short time ago, in preparation for an exercise of our professorial function, we studied Dr. W. T. M. Forbes' paper on *The Wing-Venation of the Coleoptera* in the Annals of the Entomological Society of America for December, 1922. We do not profess any expert knowledge of beetles but we have made preparations of the wings and we have followed the general outlines of the work of Lameere, Gahan and others on the application of venation to the classification of the Coleoptera. Our expectations that we would derive much instruction from Dr. Forbes were realized. We must confess, however, that what made a greater impression upon us was the fact that we were constantly compelled to turn back several pages from his plates to find out just what genus a given figure represented. At last there appeared to be nothing else to relieve our growing disgust than to take pencil and write the name of the genus alongside each one of the 71 figures on the seven plates. Our kindly feelings toward the author and the editor were not improved by these labors. It was a relief not to be obliged to repeat this performance in studying Mr. G. A. Graham's paper on the same subject in the June, 1922, number of the same Annals.

We wrote in the NEWS for October, 1921:

> One source of annoyance to the reader of illustrated papers arises from having to compare figures relating to different forms on a plate and to hunt for the names of the species in an "Explanation of Plates," or even in a list of names at the bottom of the plate. Why would it not save time and irritation and prevent neglect if we put the specific [or generic] name (or an abbreviation of the name) alongside each figure, or group of figures, on the plate itself?

A frequent contributor of papers with many illustrations to our entomological journals, with whom we had some corre-

spondence on this question of labeling figures, wrote that, while this was desirable, the expense of having the names *engraved* was prohibitive. We never dreamed of engraving. An author who draws his own figures, as most of us do, can surely lay his plate of drawings on a board with a straight edge, level it with a T-square, make two parallel pencil lines separated by an appropriate distance, near each figure or group of figures, and with his pen insert the name of the genus or species, as the individual case requires, between these guiding lines.

But of course we don't expect these suggestions (not to use a stronger word) to do any good where improvement is most needed. Those who, like Mr. Knight in the NEWS for March, 1923, are already convinced of the desirability of this practice will continue in their praiseworthy course, but those, otherwise minded (and we don't class Dr. Forbes here)—

But the editors of our entomogical journals *can* do something to improve the condition complained of. Will they?

## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### On the Geographical Distribution of Thorybes confusis Bell (Lepid.: Hesperiidae).

Though this species was described from specimens collected at Tampa, Florida, it appears that its geographical distribution covers a wide range over the southern part of the United States.

In the paper of Dr. Henry Skinner and Mr. R. C. Williams, Jr., *On the male genitalia of the Larger Hesperiidae of North America* (Transactions of the American Entomological Society of Philadelphia, Pa., XLVIII, 124), it is recorded from Blanco County, Texas; Georgia, South Carolina and North Carolina, and I have received specimens from Hope, Arkansas; Jennings, Missouri; Takoma Park, Maryland, and Washington, D. C., and have seen some from localities in Alabama.

The distribution of this butterfly therefore probably covers all of the States from Maryland, south to Florida, west to Missouri, Arkansas and Texas, and further collecting will very likely record it from the states immediately west of Arkansas and Missouri, as it does not seem at all scarce at Hope, Arkansas, which is quite close to the Oklahoma line, while its occurrence at Washington, D. C., and nearby places in Maryland make it seem probable that it will also be found in Delaware and possibly the extreme southern portion of New Jersey.—E. L. BELL, Flushing, N. Y.

### Professor and Mrs. Cockerell to Visit Siberia.

My wife and I expect to visit the coast of Siberia during the summer. Very good fossil insects have been found there. We expect to leave Seattle June 7, have four days in Japan and reach Vladivostock June 25.

T. D. A. COCKERELL.

### Robbery! High Reward! Warning to Buyers!

In the summer of 1921 the following species were stolen from our establishments: *Parnassius davidis, honrathi, simo, delph.* v. *cardinalis, charltonius, princeps, imperator* ♂, *musageta, nordmanni, etc.*, note especially: *imperator* ♀, *musageta* ♀, with gigantic ocellae, *charltonius verus* ♂, *bryki* ♀, Co-Types, as well as many exotic Lepidoptera (probably already stolen in 1920) especially show specimens and rarities.

We promise a high reward to everyone being able to furnish us any notice about these insects and we guarantee to use their information under the strictest discretion. In case one or the other above mentioned species should have been offered to you by dealers or by persons, even seemingly highly trustworthy, please send us the correspondence.—DR. O. STAUDINGER & A. BANG-HAAS, Dresden-Blasewitz, Germany.

### Vitality of a Cecropia Moth (Samia cecropia, Saturnidae, Lep.).

In the early part of the Winter, Mr. William Jay, of Mt. Airy, Philadelphia, brought me a branch of elder on which was clustered a compact bunch of eleven Cecropia cocoons, some of which were dead, but quite a few were alive. Wishing to retain the cluster of cocoons intact, I soaked them in gasoline, with the idea of killing such pupae as were alive. The cocoons were hung in a room where the temperature was kept at about seventy degrees Fahrenheit. On February 4, a male moth emerged; I placed the moth out of doors where it remained all night in a temperature between 15 and 17 degrees. In the morning the moth to all appearances was dead; I took it in the house and placed it in a room where the temperature was 50 degrees. In about an hour I noticed a twiching of the feet, so I removed the moth to a warmer room where the thermometer registered 72. In an hour the moth was flying around the room.—PHILIP LAURENT, Philadelphia, Pa.

### Bolletino della Scuola Superiore d'Agricoltura de Portici.

The authorities of the Scuola superiore d'Agricoltura of Portici, Italy, are desirous of increasing the range of diffusion of their *Bolletino* and are making a subscription price of two dollars per volume to American entomologists. This journal contains many very important articles and is well worth the price asked for it. It should be on the shelves of all our entomological libraries. Correspondence concerning subscriptions may be addressed to Professor F. Silvestri at the school.—G. F. FERRIS, Stanford University, California.

# Entomological Literature

**COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.**

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of The American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **6**—Journal of the New York Entomological Society. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **14**—Proceedings of the Zoological Society of London. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **19**—Bulletin of the Brooklyn Entomological Society. **20**—Bulletin de la Societe Entomologique de France, Paris. **34**—Bulletin de la Societe Entomologique de Belgique, Brussels. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **46**—Contributions to the Natural History of the Lepidoptera of North America. Ed. by Wm. Barnes. **49**—Entomologische Mitteilungen, Berlin-Dahlem. **54**—Proceedings of the Biological Society of Washington, D. C. **68**—Science, Garrison on the Hudson, N. Y. **70**—Journal of Morphology, Philadelphia. **86**—The Quarterly Journal of Microscopical Science, London. **88**—Occasional Papers of the Museum of Zoology, University of Michigan, Ann Arbor. **98**—Annals of Tropical Medicine and Parasitology, Liverpool. **101**—Journal of The Linnean Society of London. **111**—Archiv fur Naturgeschichte, Berlin. **114**—Entomologische Rundschau, Stuttgart. **115**—Societas Entomologica, Stuttgart. **138**—American Museum Novitates, New York.

**GENERAL. Berlese, A.**—Gli insetti, Vol. II, Fasc. 28-33. **Brues, C. T.**—Choice of food and numerical abundance among insects. **12,** xvi, 46-51. **Felt, E. P.**—Problems in economic entomology. **12,** xvi, 39-45. **Graham & Ruggles**—The obligation that economic entomology owes to forestry. **12,** xvi, 51-61. **Hagan, H. R.**—Historical outline of the development of entomology to 1800. (Trans. Utah Acad. Sci., ii, 47-54). **Horn, W.**—Et meminisse et vaticinari liceat. **49,** xii, 67-i. **Leng, C. W.**—Memories of fifty years ago. **19,** xviii, 1-12. **Sanders, J. G.**—Whither in entomology. **12,** xvi, 31-9.

**ANATOMY, PHYSIOLOGY, ETC.** **Bowen, R. H.**—Studies on insect spermatogensis. **86**, lxvi, 595-626. **Cannon, H. G.**—A further account of the spermatogenesis of lice. **86**, lxvi, 657-67. **Huettner, A. F.**—The origin of the germ cells in Drosophila melanogaster. **70**, xxxvii, 385-419. **Yocum, H. B.**—The occurrence of Telosynapsis in the male germ cells of an Hemipteron, Leptocoris trivittatus. **70**, xxxvii, 287-306.

**ARACHNIDA AND MYRIOPODA.** **Brolemann, H. W.**—Notes on female paraiulids (Myriapods), with description of a n. sp. **7**, xv, 281-309. **Stear, J. R.**—Introduced mite attacking willow. **12**, xvi, 96.

**THE SMALLER ORDERS OF INSECTA.** **Krafka, J.**—Morphology of the head of trichopterous larvae as a basis for the revision of the family relationships. **6**, xxi, 31-52. **Mertens, H.**—Biologische und morphologische untersuchungen an Plekopteren. **111**, 1923, A, II, 1-38. **Sulc, K.**—Eine neue Psylla und eine neue Rhinocola aus Surinam. Eine neue Panisopelma und eine neue Trioza aus Chile. Ueber die stinkdrusen und speicheldrusen der Chrysopen. (Sitz. Bericht. Bohmischen Gesel. Wiss., Math.-Natur. Clas., 1914, IV, V, IX). **Tillyard, R. J.**—The wing-venation of the order Plecoptera or mayflies. **101**, xxxv, 143-62. **Walker, E. M.**—Notes on the Odonata of Godbout, Quebec. **4**, lv, 5-12. **Williamson, E. B.**—Notes on the habitats of some tropical species of Heterina. A new species of Archaeogomphus. (Odonata). **88**, No. 130; 134.

**ORTHOPTERA.** **Carpentier, F.**—Musculature et squelette chitineux. (Mem. Ac. R. Belg., Cl. Sci., vii, Fasc. 3, 56pp.) **Hebard, M.**—Studies in the Mantidae and Phasmidae of Panama. **2**, xlviii, 327-62.

**Davis, W. T.**—A new walking-stick insect from eastern N. A. **6**, xxxi, 52-55.

**HEMIPTERA.** **Baker, A. C.**—Tingidae. **68**, lvii, 272. **Hungerford, H. B.**—Notes on the eggs of Corixidae. **19**, xviii, 13-16. **Matthews, A. L.**—Some uncommon plant pests. (Trans. Utah Acad. Sci., ii, 41-4.) ***Osborn, H.**—Neotropical Homoptera of the Carnegie Museum. (An. Carnegie Mus., xv, 8-79.) **Otanes, F. Q.**—Head and mouth-parts of Mecoptera. **7**, xv, 310-27. **Parshley, H. M.**—The type specimens of Lygaeus kalmii, subsp. angustomarginatus. **19**, xviii, 23.

**Davis, W. T.**—Notes on N. American cicadas with descriptions of n. sps. **6**, xxxi, 1-15. **Horvath, G.**—A new species of Galeatus from New Mexico. (An. Carnegie Mus., xv, 108-9.) **Knight, H. H.**—A new sp. of Labopidea on garlic. **19**, xviii, 31. **McAtee, W. L.**—A new sp. of Otiocerus (Fulgoridae). **54**, xxxvi, 45-8. **Olsen, C. E.**—Studies of the species in the genus Cicadella of America, north of Mexico. **7**, xv, 353-69.

**LEPIDOPTERA.** **Bell, E. L.**—Amblyscirtes textor from Virginia. Euphyes dion in New Jersey. Collecting notes on L. Collecting Florida butterflies in March. **19,** xviii, 12; 21; 24-27. **Draudt, M.**—Fauna americana. Genera Eudamus-Hercnia; Lithosiinae: Chrysozana-Tigrioides. (Seitz. Macrolep. of the World, Part 266-272.) **Gaede, M.**—Alte und neue Arctiinae des Berliner Zool. Mus., **114,** xl, 7-8 (cont.). **Heinrich, C.**—On the synonymy of the pea moth. **4,** lv, 13. **Jordan, K.**—Ueber einige alte und neue Sphingides. **49,** xii, 51-7. **Kaye, W. J.**—A catalogue of the Trinidad Lepidoptera Rhopalocera. (Mem. Dep. Agric. Trinidad and Tobago, No. 2, 1921, 163pp.). **Kruger, E.**—Weiteres ueber Columbische Brassoliden. **114,** xl, 8 (cont.). **Lavallee, A.**—Comportement et homochromie de la chenille du Sphinx pinastri. **20,** 1923, 19-20. **Prout, L. B.**—New species and forms of Geometridae. **11,** xi, 305-22. **Schaus, W.**—New sps. of Notodontidae from S. America in the Carnegie Museum. (An. Carnegie Mus., xv, 80-9). **Seitz, A.**—Fauna americana. Micrarctiinae: Eubaphe-Leptarctia. Spilosomini: Spilosoma-Turuptiana. (Seitz. Macrol. of the World, Part 272, 273). **Stichel, H.**—Beitrage zur kenntnis der Riodiniden fauna Sudamerikas. **45,** xviii, 1-9.

**Barnes & Benjamin**—Nomenclature, notes and new species. **46,** v, 53-96. **Fruhstorfer, H.**—Neue Parnassiusrassen aus Nordamerika. **115,** xxxviii, 5. **Mayfield, H. D.**—A new form of Catocala gracilis. **19,** xviii, 33.

**DIPTERA.** **Beyer, G. E.**—Observations upon Anopheles atropos. **15,** xi, 51-6. **Bishopp, F. C.**—Dengue fever and mosquitoes in the South. **12,** xvi, 97. **Branch, H. E.**—The life history of Chironomus cristatus, with descriptions of the species. **6,** xxxi, 15-30. **Dyar, H. G.**—Note on the swarming of Aedes cinereoborealis. Mosquito notes. Notes on Goeldia. On Aedes riparius. Note on the habits and distribution of Aedes flavescens in America. Note on Aedes winnipegensis and hirsuteron. **15,** xi, 56-7; 81-88; 88-92; 92-4; 94-6. **Gordon & Evans**—Mosquitoes collected in the Manaos region of the Amazon. **98,** xvi, 315-38. **Komarek, J.**—Die morphologie und physiologie der haftscheiben der Blepharoceridenlarven. (Sitz. Bohmischen Gesel. Wiss. Math.-Natur. Clas., 1914, XXV.) **Lenz, F.**—Stratiomyidenlarven aus quellen. Ein beitrag zur metamorphose der Stratiomyiden. **111,** 1923, A, II, 39-62. **Matheson & Shannon**—The Anophelines of northwestern America. **15,** xi, 57-72. **Milliken & Wadley**—Phasia occidentalis, an internal parasite of the false chinch bug. **19,** xviii, 28-31. **Plank, H. K.**—New record for Rhagoletis tabellaria. **12,** xvi, 99. **Shannon, R. C.**—A new Microdon from Bolivia. **15,** xi, 80-1. **Thompson, W. R.**—Masicera senilis, a parasite of the European corn borer. **10,** xxv, 33-44.

**Aldrich, J. M.**—Notes on the dipterous family Hippoboscidae. **15,** xi, 75-9. A new sugarcane miner. **19,** xviii, 22-3. **Hearle, E.**—A

new mosquito from Br. Columbia. **4,** lv, 4-5. **Hull, F. M.**—New Syrphidae from Mississippi. **7,** xv, 370-73. **Malloch, J. R.**—Some new g. and sps. of Lonchaeidae and Sapromyzidae. **10,** xxv, 45-53. A new N. Am. species of the genus Beckerina. The N. Am. sps. of the chloropid genus Cetema. **19,** xviii, 32-3. **Shannon, R. C.**—A reclassification of the subfamilies and genera of N. Am. Syrphidae. **19,** xviii, 17-21.

**COLEOPTERA. Bowditch, F. C.**—Studies among the American Galerucidae. **9,** lvi, 62-4. **Dury, C.**—Lepidocricus herricki. **19,** xviii, 27. **Forbes, W. T. M.**—The wing-venation of the Coleoptera. **7,** xv, 328-51. **Lucas, R.**—Coleoptera fur 1916. (Mit nachtragen zu fruheren berichten). **111,** 1917, B, V, 1-325. **Mueller, R.**—Ueber die sinneszellen im fuhler von Necrophorus vespille. **114,** xl, 5-7 (cont.). **Mutchler, A. J.**—Notes on West Indian Lycidae and Lampyridae, with descriptions of new forms. **138,** No. 60. **Pavlovsky, E. N.**—On the biology and structure of the larvae of Hydrophilus caraboides. **86,** lxvi, 627-56. **Van Duzee, E. P.**—An entomological antique. **68,** lvii, 269. **Verhoeff, K. W.**—Beitrage zur kenntnis der Coleopteren-larven mit besonderer berucksichtigung der Clavicornia. Zur kenntnis der Cantharidcn-larven. **111,** 1923, A, I, 1-109; 110-37. **Wolcott, A. B.**—Two n. sps. of West Indian Cleridae. **138,** No. 59.

**Blatchley, W. S.**—Notes on the C. of southern Florida, with descriptions of n. sps. **4,** lv, 13-20.

**HYMENOPTERA. Bell, E. L.**—A hymenopterous parasite of Epargyreus tityrus. **19,** xviii, 33. **Bluthgen, P.**—Zur biologie der bienengattung Sphecodes. **45,** xviii, 19-23. **Criddle, N.**—The life habits of Cephus cinctus in Manitoba. **4,** lv, 1-4. **Cushman, R. A.**—A new subfam. of Braconidae from termite nests. **10,** xxv, 54-6. **Davis, W. T.**—Late swarming of ant Lasius claviger. **19,** xviii, 23. **Elliott, E. A.**—Monograph of the hymenopterous family Stephanidae. **14,** 1922, 705-831. **Frison, T. H.**—Systematic and biological notes on bumblebees. **2,** xlviii, 307-26. **Stumper, R.**—Etudes sur les fourmis. V. Les reflexes de nettoyage. **34,** v, 29-31.

**Banks, N.**—Notes and descriptions of some fossorial H. **4,** lv, 21-3. **Cockerell, T. D. A.**—The earliest known ponerine ant. **9,** lvi, 51-2. Two nocturnal bees and a minute Perdita. **138,** No. 66. **Curran, C. H.**—A new genus and sp. of Xyelidae from western Canada. **4,** lv, 20.

---

A NATURALIST ON LAKE VICTORIA, with an Account of Sleeping Sickness and the Tse-tse Fly. By G. D. HALE CARPENTER, Uganda Medical Service, etc. E. P. Dutton & Co., New York. 8vo., pp. xxiv, 333, 2 col. pls., map, charts, 87 ills. First published in 1920.

The extent of entomological literature is so great and the ability to examine it so limited by the various demands on one's time, that we

make no excuse for admission to the pages of the NEWS of notices of articles and books which have been published for some years, or have not been sent to the NEWS for review, as happens in this case. We regret that so few notices of entomological literature are offered to us for publication, and would gladly welcome more.

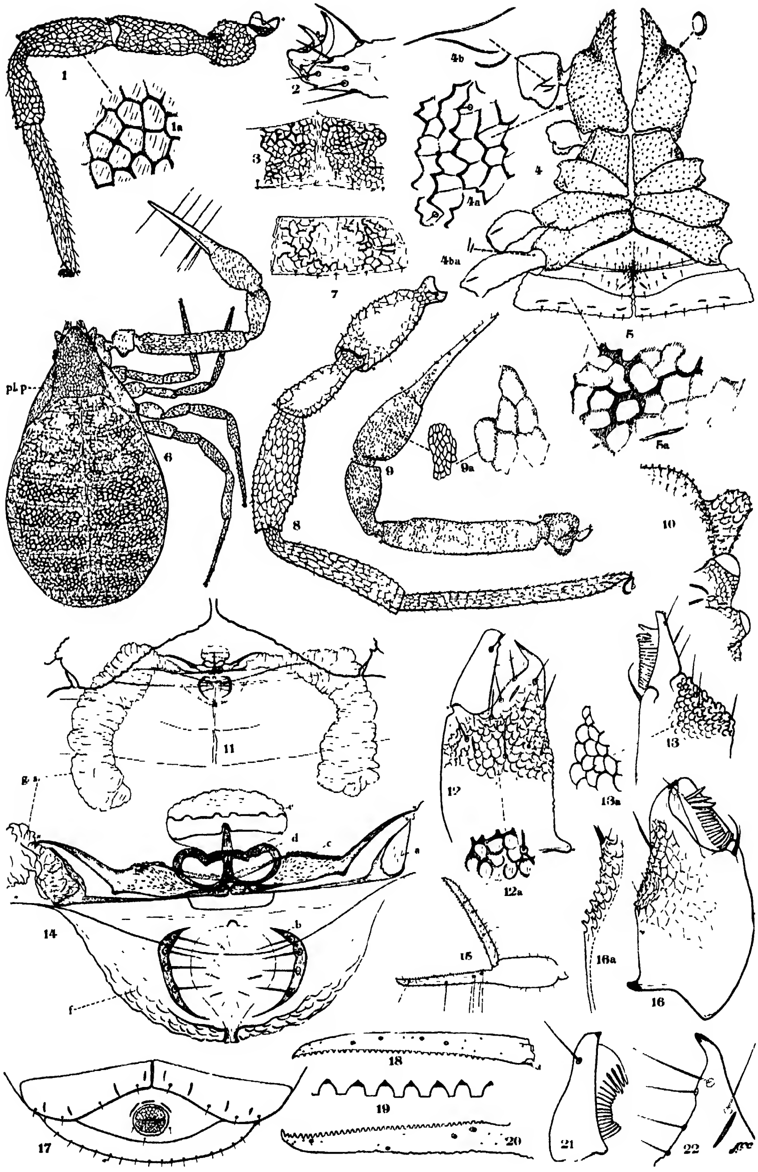
Dr. G. D. H. Carpenter, son of the well-known zoologist and student of the echinoderms, P. H. Carpenter, F. R. S., investigated the bionomics of the Tse-tse fly, *Glossina palpalis*, at various places on or near Victoria Nyanja[1], from the middle of 1910 to about March, 1913, from December, 1913, to August, 1914, and for some period subsequent to November, 1918, under the auspices of the Tropical Disease Committee of the Royal Society. "This book is an attempt to give an account of the life on the islands of the Victoria Nyanja." The first three chapters contain one of the best, summarized, historical narratives of Sleeping Sickness, its natural history and that of *Glossina palpalis*. Three chapters furnish a description of the lake, three are devoted to the vertebrates. The last four (pp. 195-322) deal with insects, 80 of these pages being concerned with the coloration of insects, as displayed in Uganda, and with the case of *Pseudacraea eurytus*. This last is a member of a genus of Nymphaline butterflies closely allied to the more widely spread *Limenitis*, but confined to the Ethiopian region, including Madagascar. *Ps. eurytus* is "a single, [widespread], polymorphic species [which] mimics sundry species of models of very different appearance in different localities; where a model is sexually dimorphic the sexes of the mimic faithfully copy the corresponding sex of the model. Yet in the very locality where this dimorphism of model and mimic exists, other species of monomorphic models are closely copied by monomorphic forms of the same species of mimic" (p. 242). That the various forms of *eurytus* are not different species is shown by the facts that, (*a*) there are no differences in the genital armature of the males, as pointed out by Dr. Karl Jordan in 1910, and (*b*) that from the eggs of the same female, reared by Dr. Carpenter, the varied forms of both sexes are produced (p. 264).

Prof. E. B. Poulton contributes a preface to this volume and many extracts from his letters to the author are contained in the chapter on *Pseudacraea*. Dr. Carpenter writes as an adherent of the theories of the value of coloration of which Prof. Poulton is so well known an advocate, and presents arguments in favor of the origin of mimetic varieties as due to natural selection as against mutation.

Notes on almost all the greater groups of insects are to be found in this book, which can be strongly recommended to entomologists and lovers of nature generally. PHILIP P. CALVERT.

---

[1]"Nyanja, not Nyanza. The former is Luganda for lake, the latter means nothing, and is erroneously copied from one book to another."




PSEUDOGARYPUS BICORNIS.—CHAMBERLIN.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXIV JUNE, 1923 No. 6

CONTENTS



# The Genus Pseudogarypus Ellingsen (Pseudoscorpionida-Feaellidae).

By JOSEPH CONRAD CHAMBERLIN, Stanford University, California.

(Continued from page 149)
(Plate V.)

PSEUDOGARYPINAE subfamily nov.

*Diagnosis—Without a ginglymous articulation between the cephalothorax and abdomen; with a distinct and prominent cephalothoracic pleural shield laterad of the carapace and dorsad of the coxae of the legs; without the double row of abdominal pleural plates so characteristic of Feaella; each anterior lateral corner of the carapace prolonged into a prominent tuberculate process; palpi typical in shape, much as in Garypus.*

**Pseudogarypus** Ellingsen.

1909—*Pseudogarypus* Ellingsen, Estratto dal Boll. del Labor. di Zoologia generale e agra. Portici: 217-218.

*Orthotype—Garypus bicornis* Banks. Western United States of America.

The genus is sufficiently characterized by the sub-family diagnosis, and, since it is monotypic, by the following specific description.

**Pseudogarypus bicornis** (Banks) (Plate V, Figs. 1-22).
1895—*Garypus bicornis* Banks, Journ. New York Ent. Soc. III: 8-9.
1906—*Garypus bicornis* Banks, With, Dan. Exped. to Siam 1899-1900, III. Chelonethi, Dansk. Vidensk. Selskr., pp. 100 and 103.
1906—*Pseudogarypus bicornis* (Banks) Ellingsen, T. c. 218.

*Previous records and habitat notes*—Banks makes the following interesting statement: "This interesting species was found by Mr. Hubbard between the laminae of rocks at Specimen Ridge, Yellowstone National Park. Many were young and had formed little cases of silk and earth, in which to pass the moulting period. The structure of these young forms is not however different from that of the adult." Ellingsen had one specimen (sex not noted) from Shasta Springs, California.

*Material examined*—A single adult male from Bear Lake, Utah. Collected by Dr. R. V. Chamberlin. Habitat not designated.

The three known records would seem to indicate that the species will be found to range throughout the mountain regions of Western North America from elevations of 2,000 to 8,000 feet, depending upon various climatic factors.

*Measurements*—All the following series of measurements are given in millimeters. Length always precedes breadth and measurements of the legs and palpi are from trochanter to tarsus. Measurements are taken in the way With describes in his paper of 1906, pp. 57-58, (ref. cited under Feaellidae).

Length 2.7 mm. Carapace, (0.72-0.396). Abdomen, (2.03-1.57).

Palpus—(0.216-0.224), (1.116-0.216), (0.522-0.225), hand (0.522-0.288), fingers (0.828).

Chelicera—Length (tip of movable finger to base of hand), 0.243; width of hand 0.234; length of movable finger 0.108.

Leg I—(0.270-0.162), (0.387-0.117), (0.342-0.126), (0.288-0.09), (0.54-0.0684).

Leg IV—(0.34-0.162, (0.306-0.108), (0.45-0.108), (0.576-0.09), (0.756-0.0684).

Palpal teeth of movable finger—Average basal width 0.0115; average heighth 0.0115; average distance between teeth, 0.0076.

In the figures the points from which measurements were made are indicated by small cross marks (Fig. 9 for example).

*Morphology*—The carapace is much as shown in Fig. 6, but is scarcely as sharply marked off from the pleural plates (Fig. 6 pl. p) as might be inferred from the drawing. Rather the demarcation is a sort of "fading" from the hard reticulated chitin to a similarly reticulate divisional membrane, and thence to chitin again, much as shown in Fig.

3. There is a slight trace of a median longitudinal furrow but this is not surely valid. The two anterior lateral horns arise from under the eye tubercles and extend forward almost even with the anterior median part of the carapace. Both anterior and posterior eyes are borne upon distinct tubercle-like processes (Fig. 10). Closely associated with the eyes (Fig. 10) are two or three lyriform fissures. The pleural plates are more or less sub-triangular, the apex lying almost directly under the posterior eye, while the more or less evenly rounded basal portion lies about even with the anterior margin of the third pair of coxae. Apparently they are somewhat more heavily chitinous than the carapace.

There are only ten visible tergites, the eleventh being fused with the last sternite and being completely invisible from a dorsal aspect. All tergites with the exception of the tenth are divided longitudinally by a distinct membranous suture, or rather area (Fig. 4). The first two tergites lie between the pleural plates and in consequence are considerably smaller than those which follow. Each tergite bears posteriorly from 18-20 or more minute setae which are very difficult to see on account of the heavy reticulation of the tergite and their minuteness. Likewise bordering the posterior margin of each tergite are about 10-18 lyriform fissures which are anterior to the setae row and which lie more or less laterally. Segment V bears 16 such fissures and in addition has one near each anterior lateral corner; the bordering setae number 20.

The chelicerae are basally (all but the fingers) entirely hidden from the dorsal aspect by the carapace. They are so completely figured (Figs. 12, 13, 16, 21, and 22) that there is little point in describing them in detail but a few points should be noted. The serrula exterior consisting of 17 or 18 teeth, is fused along its entire length to the movable finger, but as is clearly shown in Fig. 21 it is not a very long step to a condition where it would be distally free. This is practically identical with the type found in a few, if not many, of the Obisiidae, forms which are supposed to have this organ distally free. Lamina exterior absent or possibly present in a much reduced vestigial condition. The serrula exterior is apparently of a broad plate-like type and not toothed as in many forms, but its structure could not be worked out in any but the most sketchy way with the material available. The galea is apparently present (Fig. 13) but it is broken off on both chelicerae of my specimen. The arrangement of the setae and lyriform fissures will almost surely be found to be generic in character. The flagellum consists of two apparently simple setae, the anterior one of which is longest and also strongly curved distally (Fig. 13-16). An interesting feature of the chelicerae is the extremely rugose and heavily chitinized area on the basal part of the fixed finger and that part of the hand adjacent to it (Fig. 16 and 16a). Fig. 16a shows by a dotted line the actual thickness of the chitin and shows how greatly it increases in density where the rugosity is greatest. These rugose portions of each chelicera normally face each other and hence it seems likely that they

are manducatory in function, their rugosity and heavy structure admirably adapting them for a crushing or tearing function.

The coxae of the palpi or the maxillae are very large, having almost as great an area as that of the coxae of all the legs combined. They partially overlie the basal part of the chelicerae. I am not able to entirely follow With, in his excellent treatment of the maxillae in his paper of 1906, but apparently he applies this name to the entire coxae of the palpi. The anterior seta bearing portion is spoken of as the manducatory portion (Fig. 4). The central elliptical lyriform fissure is present but rather small (Fig. 4bb). This fissure is found in many of the Obisiidae and some of the Garypidae, but not apparently in the Cheliferidae or related families, thus forming another bit of evidence tending to show that the affinities of the genus *Pseudogarypus* are not with the single-segmented-tarsal forms. The labrum apparently consists of a rather elongate, narrow process, which is semi-membranous in structure, with an evenly rounded anterior termination. The sucking organ and a number of other oral structures could not be worked out in my specimen. The trochanter of the palpus bears ventrally a system of three prominent lyriform fissures (Fig. 4b), while the trochanter of each of the legs bears a single one. Minute setae are sparsely scattered over the coxae. Each coxa bears a single lyriform fissure near its posterior lateral corner.

The palpi while resembling those of *Garypus* are notable for their comparatively short tibia, which is no longer than the hand. (Fig. 9). The arrangement of the tactile setae is figured in detail. All the setae have been broken off in my specimen but the wide areoles leave no doubt as to their function. The prominence and even and compartively wide spacing of the palpal teeth is noteworthy. The fixed finger bears 41 teeth; the movable one 33.

The legs are figured in detail, showing the approximate distribution of the setae and the characteristic reticulation. The setae bordering the posterior margin of the tarsi are apparently not paired although giving a superficial appearance of it. No tactile setae were observed on any of the legs, nor were any areoles noted which were fitted for their reception. This latter might be very easily overlooked however owing to the roughness of the reticulations. Both claws and subterminal setae are simple (Fig. 2). The smooth place on the trochanter and pars basalis of Leg IV (Fig. 8) is apparently where they rub against the body of the animal.

The genitalia are fairly complex and present a very characteristic general appearance (Fig. 11 and 14). Owing to the lack of a terminology it is impossible to say much concerning the genital characters other than to point out some of the most salient features. Overlying the entire genitalic structures are the first two abdominal sternites (really the first and third?), the first one entire and more or less subtriangular, the second one typically divided. They bear medially

a dense cluster of minute setae (Fig. 5). Everything shown in Fig. 14 is internal. The genital sacs (Fig. 11 g. s.) form one of the most interesting features. They are almost surely homologous with those similar structures found in the males of *Garypinus* (Chamberlin, 1923).* These genital sacs are found generally throughout the Obisiidae apparently. The prominent lateral chitinous rods or apodemes (Fig. 14-c) apparently help support these sacs. They are connected across ventrad of the median chitinous loop (Fig. 14-d) by a rather slender chitinous rod or bridge. Apparently they attach basally to the median loop. Projecting anteriorly from this loop extends a short chitinous rod which bears distally a complex semi-membranous sac (?) or structure (Fig. 14-e). The genital sacs themselves seem to arise from two slender rods which distally flare into a cone-like funnel structure (Fig. 14-a). Posteriorly there appear two prominent crescent-shaped sclerites, each bearing four prominent setae (Fig. 14-b). Apparently ventrad (not surely) of these sclerites is a large, lunate, rather weakly chitinized structure which I believe to be the wholly invaginated and hidden second ventral sternite (Fig. 14-f).

As I see it the ventral segmentation is as follows. There are in all 11 sternites (the normal number of segments in the Pseudoscorpionida). Of these the last one has fused with the 11th tergite to form the shield bearing the anal opening (Fig. 17). The first one is the broadly triangular, unpaired sclerite which lies immediately behind the fourth coxae. The second one then consists of the aforementioned lunate, internal, unpaired structure (Fig. 14-f) which has been entirely invaginated and hidden by the forward growth of the third sternite which thus superficially appears as the second segment (Fig. 5). Thus the second segment has been modified for some special function in connection with the genitalia. (A study of female and immature specimens, I should say, will prove or disprove this theory). In structure and general appearance the sternites are very similar to the tergites. The central reticulation of each lateral half is however visibly different, the reticulations forming a sub-circular region where the areas enclosed by the somewhat fainter than normal reticulations, are considerably smaller than on the rest of the sclerite. The fifth sternite is bordered posteriorly by a row of 24 minute setae and 10 lyriform fissures. The lyriform fissures of the posterior segments appear to have a distinct tendency to assume a longitudinal position in the sternites but this is not the case in the anterior ones (Figs. 5 and 17). An interesting feature is found in the lyriform fissures which tend to encircle the anal opening. Each half of the bi-partite anal operculum bears two minute setae (Fig. 17).

*Remarks*—Unfortunately I am unable to say anything regarding the structure of the spiracles. Apparently they are

*1923—Chamberlin, J. C., Proc. Calif. Acad. Sci., Vol. XII.

located in the more or less membranous portion of the abdominal pleura and hence are practically impossible to observe without more dissection than is advisable in the present case.

The skin structure forms one of the most characteristic features of the animal. It seems to be very much like that found in *Feaclla,* but as I have seen no specimens of the latter genus I cannot speak definitely. The figures give a fairly adequate impression of its general appearance.

EXPLANATION OF PLATE V.

1—Leg I.
1a—Detail of skin reticulation of leg.
2—Detail of tip of tarsus of Leg I.
3—Median portion of 7th abdominal tergite, showing membranous median area and longitudinal scutal suture.
4—Coxae of legs and palpi.
4a—Detail of skin reticulation of coxae.
4b—Lyriform fissures of coxa of palpus.
4ba—Small lyriform fissures on dorsal aspect of pedicel of trochanter of Leg IV.
4bb—Circular lyriform fissure of coxae of palpi.
5—Genital area and first few ventral abdominal segments showing distribution of superficial setae and lyriform fissures.
5a—Skin detail of abdominal sternites.
6—General dorsal aspect of entire animal showing general appearance. The tactile setae of the fingers of the palpi were broken off in the specimen available for study.
7—Skin detail of right half of 2nd abdominal tergite.
8—Leg IV.
9—Palpus (On smaller scale than 1 and 8).
9a—Skin detail on hand of palpus.
10—Detail of carapace. Right half of anterior margin showing the anterior "horns" and the positions of the eyes.
11—General aspect of internal genital structures, showing primarily the position and relative size of the convoluted *genital sacs.*
12—Dorso-lateral aspect of chelicerae.
12a—Skin detail on chelicera.
13—Lateral aspect of chelicera.
13a—Skin detail.
14—Details of internal chitinous structures of the genitalia.
15—Claw of palpus from a lateral aspect. Tactile setae not seen.
16—Ventro-lateral aspect of chelicera.
16a—Detail of heavily granulate margin of chelicera. The dotted line indicates thickness of chitin.
17—Ventral aspect of tip of abdomen showing the fused 11th tergite and sternite which medianally bears the anus with its divided operculum.
18—Lateral aspect of movable finger of claw of palpus showing dentition and positions of the tactile setae areoles.
19—Detail of dentition of fingers of claw of palpus.
20—Lateral aspect of fixed finger of claw of palpus showing dentition and positions of tactile setae areoles.
21—Dorsal aspect of movable finger of chelicera.
22—Ventral aspect of fixed fingers of chelicera.

**Notes on the Desmodium Sawfly, Atomacera desmodii Dyar* (Hymen.: Tenthredinidae).**

This species, while not recorded by Smith in his "Insects of New Jersey," is known to occur at Monmouth Junction and undoubtedly exists in other sections of the state where its food plant grows. It was described by Dyar in 1900 (Jour. N. Y. Ent. Soc., vol. VIII, pp. 26-27) from specimens collected by him in company with Mr. Busck in Alexandria County, Virginia.

At Monmouth Junction, New Jersey, adults appear from about the middle of May to the first week of June and the females deposit their eggs in the leaves of *Meibomia* (*Desmodium*) *canadensis,* which plant is common along the borders of streams and swamps in the northern half of the state. The egg is inserted in the leaf from the upper surface and the tissue is pushed out considerably above and to a small extent below each egg. This results in a little, blister-like swelling which later becomes tinged with red. The presence of eggs is readily recognized by such discolored swellings. Each egg is whitish, translucent, irregularly bean-shaped, broadly rounded at both ends, somewhat compressed at sides and about 0.7 mm. long and 0.48 mm. wide across the middle. Some eggs are deposited in irregular, somewhat compact groups, whereas others are placed scatteringly in the leaf tissue. Various leaves were examined and found to contain from 5 to 30 eggs each.

After hatching the larvae feed on the lower surface of the leaf eating everything except the upper epidermis. The leaf is thus skeletonized from the lower surface. The larvae are somewhat gregarious and feed in groups of two or three or more. Most of them are greenish, but some of them have a pink or red tinge, many of these latter ones, however, being mature or nearly so. In severe infestations nearly every leaf on a plant is injured and sometimes killed.

After becoming full grown the larvae descend to the base of the plant and construct on the surface of the ground, somewhat loose, irregular, sepia-colored cocoons. In captivity, with soil absent, these cocoons are made between two parts of a folded leaf or between the small developing leaves at the tip of a shoot. Pupation requires about eight days during the summer and the winter is passed by either larvae or pupae in cocoons at the base of plant. Observations made in the field at Monmouth Junction indicate two broods, about two months being required for a complete life cycle. Adults are present in numbers during the last of May and first part of June and again during the last of July and first part of August. Due to the emergence of the adults and egg deposition over a period of several weeks, considerable overlapping of the broods takes place. The larval stages were described by Dyar (loc. cit.) and need not be gone into here.—HARRY B. WEISS and RALPH B. LOTT, New Brunswick, N. J.

* Identified by Mr. S. A. Rohwer through the courtesy of Dr. L. O. Howard.

# Studies on Costa Rican Odonata.

## X. Megaloprepus, Its Distribution, Variation, Habits and Food.

By Philip P. Calvert, University of Pennsylvania, Philadelphia, Pa.

(Continued from page 135 )

### Habitat.

As has been stated in the Neuroptera volume (page 53) of the *Biologia Centrali-Americana*, *Megaloprepus* is an inhabitant of tropical forests. The "Florida road," west of Guápiles, from which our specimens Nos. 2-7 were obtained was, to quote from my diary of June 3, 1909:

a trail leading into untouched forest . . . westward. . . . We followed it for about a mile perhaps. . . . Its width varies and is often not greater than that of one's body, but is travelled often on horse- or mule-back. On each side of the trail the vegetation is so thick and dense that one can not make way for more than a few feet unless he cut it with a machete. . . . In this forest are mingled deciduous exogenous trees of many kinds and a variety of palms. The former are rather high on the whole perhaps, but there are many exceptions. All the trees lack branches until they are many feet above the ground but this lower space is occupied by the epiphytes and parasitic plants, bromeliads, ferns, orchids, lianas and other vines which from the trunks or from the far-away branches shoot upward or hang down and twist and twine in both profusion and confusion. On the ground itself are shrubs and smaller plants reaching up to mingle with those descending. There is much difference in the trunks of the trees as to bareness or to being covered with lichens. The large exogenous trees rise out of the soil with many ridge-like buttresses, while the palms have many aerial roots. Most of the birds are far away overhead in the foliage of the trees proper, but sometimes an opening above, admitting sunshine, gives a glimpse of them, or there is a swarm of butterflies around a full-flowered tree. [Peccaries and red monkeys were observed by some of our party here this day.]

Another forest area near Guápiles, in which male No. 1 was taken on June 2, 1909, and which was revisited on June 4, is described in my diary of the latter date in these words:

The forest differs from that through which the Florida road passes in the very much fewer palms to be found in it, although the difference in elevation is not more than 100-200 feet. It may have been partially cleared once, but as many of the tall exogenous trees are untouched

and surrounded by thick growth it seems unlikely that these would have been left and the palms cut out if they had been here, since comparatively few species of the latter are of use to man.

The female from Guacimo, of June 7, 1909, was brought to me alive by Messrs Stähle and Blair, who said that they had caught it in the banana field. As these fields in many places extended to the forest, no long flight would be required of the *Megaloprepus* to come into the open.

The cañon of the Rio Reventazón at Juan Viñas, in which this species was observed on June 25 and September 29, was occupied by the remains of a forest including

great trees draped with mosses and Tillandsias, hung with lianas, with epiphytic bromeliads and arums perched on every projection. On a lower level were small palms, begonias, maiden hair and other ferns, arums large and small, and many kinds of Musaceae and Marantaceae, etc., many with large bracts of brilliant red or orange. A cart road descended the side of the cañon in a series of zigzags.

At Peralta, on August 7, 1909, a *Megaloprepus* was watched in

tropical forest with very tall exogenous trees and many palms from both of which hung lianas, mosses and ferns, the lianas binding the trunks and branches together, while the soil was very damp and in places deep mud. Altho' the sun was shining the foliage was dense enough to prevent strong light from reaching the ground. . . . It was between two views of monkeys [*Cebus capucinus*] that I saw a *Megaloprepus* . . .alight first on one then on another twig, 7-10 feet above a little stream whose waters were arched over and partly covered by vegetation. . . . [The next morning, August 8], I went back to the woods where I saw the monkeys and *Megaloprepus* yesterday afternoon, but although I spent two hours in the immediate neighborhood, I saw none of the two M's.

On August 10, I went up the Chiriqui [?] river trail; the river empties into the Reventazón one mile north of Peralta station on the railroad. After passing through woods,

I reached a clearing with much grass and a few trees, beyond which was a grove of large trees with no undergrowth or grass, the ground much cut up with hoofs and muddy. Crossing this clearing I caught a *Megaloprepus* much to my surprise—the locality was indeed 'far from water' but certainly not 'deep woods.' The buttress-roots of some of

the trees in the grove enlarged the diameters of their trunks at the ground to twenty or thirty feet. The altitude of the little hill on which this grove was situated was 1400 feet by my aneroid.

One individual *Megaloprepus* was observed in a stretch of woodland along Agua Buena creek, within two miles of the Caribbean coast, on November 7, 1909,

alighting on leaves and stems for longer or shorter periods, sometimes directly over water, at others not more than ten feet away, and sometimes not more than one foot from the water's surface.

Another individual was seen, at about five miles (8 km.) distant from the preceding locality and six miles from the sea-coast, in dark forest, near the upper reservoir, on the Rio Banana, supplying Limón with water, November 9. In this same forest were seen or taken *Mecistogaster modestus, Philogenia carrillica, Protoneura remissa, Gynacantha gracilis* and *Triacanthagyna satyrus* Martin, teste Wllmsn. (*trifida* auctorum, *pars*).

## Time of Flight.

The dates when the imagos were seen or taken on the Atlantic slope of Costa Rica fall between April 22 and November 18. These are in the wetter part of the year although no sharp distinction into wet and dry seasons can be made for this slope. The few dates from the Pacific side of the country, where this distinction holds good, are in the wet season; one exception, however, must be noted. The male from Quebrada de Java, cited in the *Biologia*, page 352, was dated 18. II. 97, presumably, therefore, in the dry season.

## Manner of Flight and Position at Rest.

The following notes were made at Guápiles, June 2, 1909:

When flying the four wings are spread quite far apart, fore and hind wing of the same side far apart, body horizontal. Flight slow enough so that the movements of each separate wing can be seen—insect consequently moves slowly but can dodge. Mr. Barnes compared the movements of the wings to that of a windmill, but the revolving movements are lacking; I should say the effect produced by the wings is more like that of a jumping-jack with movable arms and legs pulled by one string, rather slowly, but, of course, at regular intervals.

When caught and held by the wings, the legs are folded up against

the thorax and held immovable, even though they are touched or rubbed —animal seems to "play 'possum." Held by the mid-abdomen, movement soon appears in legs and wings.

The male on which these notes were based was kept alive and after dark let loose in my bedroom, whose walls and ceiling were of dark-stained wood, with yellow straw matting on the floor, and having an incandescent electric light hanging from the ceiling in the centre of the room. [The light was turned on.] *Megaloprepus* always went up to the ceiling, a height of 8-9 feet, although the light hung at mid-height from floor to ceiling. Once, when released near the light, the insect got under its fluted shade and bumped against it repeatedly until I gently moved the insect out and then the latter went up to the ceiling. I noticed that specimens in the forest at which I struck and missed usually rose, at the same time making into the vegetation.

The dark purple blue band on the otherwise clear wings makes the insect conspicuous when flying through the forest. Some writers, who have not seen this insect in life, have suggested that the dark bands, by resembling flickering shadows cast by leaves, etc., are thereby protective, but I can not see that this supposed resemblance exists.

As to the position assumed by *Megaloprepus* when at rest under entirely natural conditions, I have but one note, made at Peralta, August 7, 1909, in continuation of that quoted *anteá,* page 169, viz.: that on alighting on twigs, the abdomen and wings hung downward, the abdomen almost perpendicularly.

The experiment in my bedroom, the occurrence of the specimens in the banana field at Guácimo and in the grove on the Chiriqui river trail near Peralta may, perhaps, indicate positive geotropic and phototropic tendencies in this insect in spite of its normal habitat in dense forest.

### Persistence of Life Without Food.

The female taken at Guácimo on June 7, 1909, was carried alive to Cartago where it flew a little around our room in the afternoon of June 8 and had some power of wing movement on June 9.

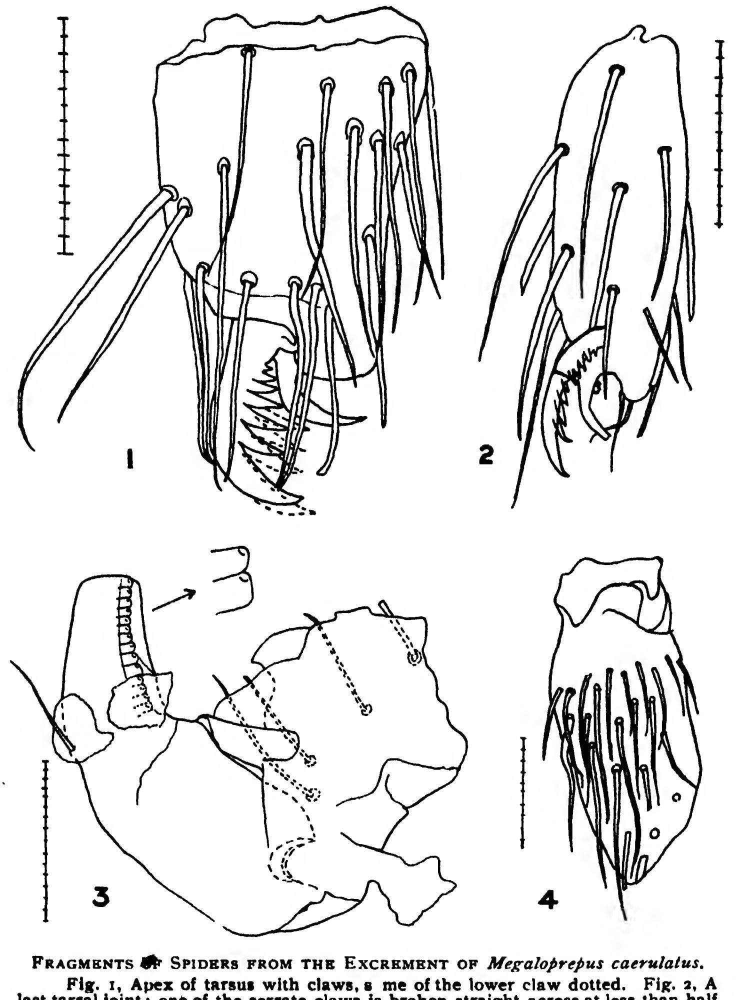
### Food.

The male *Megaloprepus* No. 14, taken at Alajuela, Costa Rica, August 8, 1915, by Mr. D. E. Harrower, remained in the paper envelope in which it had been placed by the collector until August 10, 1922. It was then studied in detail for the

first time and was found to have a spider, about 5 mm. long, in its mouth. The spider was held principally by the dragonfly's labium which was below the prey, all the other mouth parts being above it and their positions not indicative of having had hold of it at the time of death of the dragonfly. The maxillae were almost touching each other at the tips of their inner lobes, the mandibles had their tips partly crossed. The median lobe of the labium was thrown caudad of the lateral lobes, the position of the latter being such that their sharp (unarticulated) spines held the spider between them. The anterior four legs of the dragonfly were drawn up toward the mouth and in the dead insect supported the anterior part of the spider's body—whether this was only a death position or represented actual conditions while the dragonfly was alive, it is impossible to say. It was the hind end of the spider that was held by the lateral labial lobes; it had already been lacerated and some small detached pieces of it were found deeper in the dragonfly's mouth. The chelicerae, pedipalps and all eight legs of the spider were still attached to its body, but several of the more distal joints of the anterior three left legs had become detached when the examination was made, which was after the dragonfly in its envelope had been in a relaxing jar for 24 hours.

This spider was kindly examined by Mr. Nathan Banks who wrote that it was "an immature specimen of a *Gasteracantha;* it might be one of two or three closely related species, probably *cancriformis* or *kochi.*"

It is frequently my practice, when collecting Odonata, to put each specimen at once, into a paper envelope for some hours before killing it in order that it may empty the contents of its alimentary canal and so lessen the amount of decomposition within its body after death and reduce the extent of discoloration of the abdomen. Having done so with some of my *Megaloprepus* and having preserved their excrement, I softened the pellets in distilled water, teased them apart, dehydrated, cleared and mounted them in balsam. A microscopic examination of the excrement of male No. 1 revealed the two fragments represented in text figures 1 and 4, while from that of



FRAGMENTS OF SPIDERS FROM THE EXCREMENT OF *Megaloprepus caerulatus*.

Fig. 1, Apex of tarsus with claws, s me of the lower claw dotted. Fig. 2, A last tarsal joint; one of the serrate claws is broken straight across at less than half length, the other is intact. Fig. 3, Basal part of a chelicera; dotted lines show hairs on the under side of the preparation. Fig. 4, Terminal joint of a pedipalp?[18] Figs. 1 and 4 are from the excrement of male No. 1, figs. 2 and 3 from that of female No. 8. All four drawings were made by camera lucida attached to a compound microscope with oculars 2 or 3, objectives C or DD Zeiss. Alongside each figure is a scale in 1-100s of 1mm.

[18] A comparison of our figures 1-4 with the following figures in Prof. J. H. Comstock's *Spider Book:* 121, 122, page 123 (tarsal claws); 81, page 101 (chelicera); and 90, page 105 (pedipalp), respectively, will enable the interested reader to judge of the probability of the correctness of the legend below our figures.

female No. 8 came the pieces shown in figures 2 and 3. Mr. Banks saw the drawings from which these figures have been made and wrote of them:

Numbers 1 and 2 show tips of tarsi of probably an Agalenid spider, but if front tarsi might be, as far as I can tell, of a Theridiid spider. They are not of an Epeirid spider (family of *Gasteracantha*), since there are no accessory claws (serrate spines) present. I cannot guess the family of the other figures.

In this connection may be quoted a passage from a non-entomological source[14] recording the only observation known to me on the food habits, not of *Megaloprepus* it is true, but of another member of its group:

Spinning through the aisles made by the giant columns of tree-trunks, were curious translucent pin-wheels, and not until we captured one in the butterfly net did we realize we were looking at the same attenuated forest dragon-flies (*Mecistogaster sp.*) which had deceived us so completely five years ago in Mexico. The movement of the long narrow wings with the spot of white at the tips was, to the eye, a circular revolving whirl, with the needle-sized body trailing behind. The white spots revolved rapidly, while the rest of the wings became a mere gray haze. These weird creatures, apparently so ethereal and fragile, were hunting for spiders, and their method was regular and methodical. From under leaves or from the heart of widespread webs, good-sized spiders were snatched. A momentary juggling with the strong legs, a single nip and the spider minus its abdomen dropped to the mould, while the dragon-fly alighted and sucked the juices of its victim. If we drew near one of these spiders on its web, it instantly darted away, sliding down a silken cable to the ground or dashing into some crevice, but the approach of the hovering dragon-fly, although rather deliberate, was unheeded, the spider remaining quiet until snatched from its place.

Spiders are not included in Mr. Campion's list of *Some Dragonflies and their Prey*.[15]

I was unable to find the still unknown larvae of *Megalopre-pus*. One would expect them to occur in situations analogous to those of *Mecistogaster*, whose larval characteristics and transformation were described in Numbers II and III of these Studies.[16]

[14] Beebe, M. B. and C. W. Our Search for a Wilderness, New York, Henry Holt & Co., 1910, pp. 270-271. The observation was made near the Big Aremu River, British Guiana, in late March, 1909.
[15] Annals & Magazine Nat. Hist., London, (8) XIII, pp. 495-505. 1914
[16] Entom. News, XXII, pp. 402-411, 449-460, pls. xvii-xix, 1911.

# The Cordylurid Genus Paralleloma and its Nearest Allies (Dipt.).

By J. R. MALLOCH, U. S. Bureau of Biological Survey, Washington, D. C.

(Continued from page 140.)

## PARALLELOMA Becker.

This genus is difficult to distinguish from *Cordylura*, at least in this country, if one attempts to do so by using the principal character cited by its describer for that purpose. The dorsocentrals in the great majority of the species of *Cordylura* are very much stronger than in typical species of *Paralleloma*, but in some species they are weak and only the complete sixth wing-vein serves to separate them from *Paralleloma* when this is the case. I have included in the key *Cordylura praeusta* Loew, and a new species of that genus which have the thoracic dorsocentrals much weaker than is the rule in *Cordylura*, though they belong to that genus.

The genotype of *Paralleloma*, *albipes* Fallen, has the apical third of the first wing-vein setulose as has also another European species I have seen. No American species has more than one or two weak setulae near apex of first vein but I do not consider they are entitled to generic separation.

Thoracic coloration in this genus is very variable, some species having the dorsum entirely black, or yellow, or with a pale central vitta and two black lateral vittae.

### *Keys to species.*

*Males.*

1. Mid tibia without long hairs on ventral surfaces .................. 2
—Mid tibia with erect soft hairs on ventral surface which are at least as long as diameter of tibia .................................. 3
2. Basal segment of fore tarsus with fine hairs on posterior side which are longer than width of segment, mid and hind femora with dense erect soft hairs ventrally; processes of fifth sternite rounded at apices ........................................... *tarsalis* sp. n.
—Basal segment of fore tarsus and mid and hind femora without such hairs; processes of fifth sternite truncate at apices.. *scapularis* (Loew)
3. Sixth wing-vein complete; fifth abdominal sternite elongate, tapered posteriorly, bare on disc, and armed with a number of black bristly hairs along its upper margin; thorax entirely yellow .............................................. *Cordylura praeusta* Loew.

—Sixth wing-vein not reaching margin of wing; fifth abdominal sternite not as above ........................................4

4. Processes of fifth abdominal sternite rounded at apices, their surfaces with long and moderately dense hairs all over ............5

—Processes of fifth abdominal sternite either emarginate at apex or the surface has at most a few weak hairs ....................6

5. Fore tibia with long yellow hairs on posterior surface in addition to the yellow bristles; pleurae largely black or at least with a black streak posteriorly; mesonotum black to extreme lateral margin ........*pleuritica* (Loew) (*slossonae* Coquillet; *vicina* Cresson?)

—Fore tibia with very short yellow hairs, the strong bristles black and not very long; pleurae entirely yellow; mesonotum narrowly yellow along lateral margins ...................... ...*dimidiata* Cresson

6. Neither mid nor hind femora with strong black bristles ventrally....7

—Both mid and hind femora with strong black bristles ventrally......8

7. Fore tibia with soft hairs on posterior surface which exceed in length the diameter of tibia; all hairs on mid tibia much longer than diameter of tibia; fifth abdominal sternite broad, longer than in *praeusta*, the apex with a slight rounded emargination...*emarginata* sp. n.

—Fore tibia similar to above; mid tibia with hairs not distinctly longer than its diameter except on its posterior side; processes of fifth abdominal sternite slightly pointed at apex, the ventral margin longer than the upper and straight, the upper or dorsal margin with a small but distinct rounded emargination near base, the apex not emarginate ......................................*banksi* sp. n.

8. Fore tibia with short hairs in addition to the long bristles; mid tibia with the ventral hairs not longer than the tibial diameter except posteriorly; posterior notopleural bristle present; sixth vein tapered to a fine line apically; processes of fifth abdominal sternite short and broad, with a small rounded emargination........*similata* sp. n.

—Fore tibia with short hairs, the bristles weak; all hairs on ventral surface of mid tibiae as long as, or longer than, tibial diameter; posterior notopleural bristle absent; sixth vein abruptly broken off at apex; processes of fifth abdominal sternite narrow and rounded apically, their lower margin straight to near middle, presenting a truncate appearance and with a few short setulose hairs at lower anterior angle .........................*munda* (Loew)

*Females.*

1. Fore femur with 3 long, black bristles on basal half of posteroventral surface; cross-veins of wings not distinctly infuscated; mid and hind femora without ventral bristles ........*scapularis* (Loew)

—Fore femur with at least 4 long, black bristles on posteroventral surface, the last one distinctly beyond middle, at least the outer cross-vein infuscated; hind femur with ventral bristles...........2

2. Sixth wing-vein complete, traceable to wing margin ..............3

—Sixth wing-vein not reaching margin of wing ....................4

3. Yellow species, legs and palpi yellow; a pair of fine setulose apical hairs on scutellum; abdominal tergites with distinct apical bristles ............................................... *praeusta* Loew

—Glossy black species, legs black, bases of femora and entire fore tibia yellow, fore tarsi yellow at bases of segments below, and black at apices; no apical hairs on scutellum; abdominal tergites without distinct apical bristles ...................... .....*deceptiva* sp. n.

4. Mid femur with one or two strong bristles beyond middle on anteroventral surface; thorax either entirely yellow or with two linear brown dorsal vittae, both notopleural bristles long and strong; first vein with one or two setulae on apical half......*similata* sp. n.

—Mid femur without anteroventral bristle, or the thoracic dorsum is largely or entirely black; first vein bare ........................5

5. Mid femur with one or two bristles on apical half of ventral surface; posterior notopleural bristle present; pleurae yellow; ventral bristle on mid tibia of moderate size ..................*glabra* (Loew)?

—Mid femur without bristles on apical half of ventral surface .......6

6. Pleura with a black vitta below base of wing; last section of costa, between apices of veins 3 and 4, less than half as long as preceding section; humeri almost entirely black; ventral bristle on mid tibia strong ....................................*pleuritica* (Loew)

—Pleura entirely yellow; lower half of humeri yellow ..............7

7. Posterior notopleural bristle absent; mid tibia with a ventral bristle ............................................... *munda* Loew

—Posterior notopleural bristle present ............................8

8. Thoracic dorsum glossy black ...................*dimidiata* Cresson

—Thoracic dorsum yellow, with 2 broad black vittae ...*emarginata* sp. n.

**Paralleloma scapularis** (Loew).

Pale yellow, black on upper half of occiput, ocellar spot, each side of dorsum of thorax and scutellum, almost all of metanotum, and the abdomen except hypopygium in male. Wings clear.

Mid and hind femora in both sexes without distinct ventral bristles. The only male I have seen lacks the prealar bristle.

Originally described from Canada. I have seen specimens from Glen House, New Hampshire, and Cohasset, Massachusetts, and took it at Chain Bridge, Virginia, and Grand Tower, Illinois.

**Paralleloma tarsalis** sp. n.

♂.—Shining black; head whitish yellow, upper half of occiput and ocellar spot black; thorax with a yellowish vitta which does not extend over scutellum; a black mark covers most of the metanotum and is faintly visible below bases of wings and above hind coxae; processes of fifth sternite and the legs yellow. Outer cross-vein and tips of wings clouded.

Hairs on fore tibia short, the bristles weak; fore tarsus slightly broadened, the marginal hairs longer than usual, especially on posterior side of basal segment; mid and hind femora with soft erect dense hairs on ventral surfaces which are not conspicuously longer at any part than diameter of femur; mid tibia without soft hairs, the bristles short. Processes of fifth sternite moderately long, parallel-sided, rounded apically with but few hairs. Venation as in *munda*.

Length, 7 mm.

*Type*, Chain Bridge, Virginia, May 7, 1922 (J. R. Malloch), in the author's collection. *Paratype*, male, Ottawa, Canada (U. S. N. M.).

**Paralleloma pleuritica** (Loew).

Pale yellow, black on occiput except lower third, upper half or more of frons, entire dorsum of thorax, scutellum and metanotum, all of abdomen except the hypopygial forceps of male, and a stripe below and behind bases of wings, and sometimes the greater part of pleurae. The hind femora are sometimes brown above apically, and there is usually a brownish suffusion on the cross-veins and apices of wings anteriorly.

The male has the fore and mid tibiae long haired ventrally and posteriorly and all the femora long haired ventrally and without distinct ventral bristles. The female has a preapical anteroventral bristle on hind femur, and a preapical ventral bristle on mid tibia. The processes of fifth abdominal sternite in male are a little longer than broad and evenly rounded apically.

Originally described from Canada. Since recorded from Massachusetts, New Hampshire, Connecticut, and New Jersey. I have seen specimens from Rhode Island and Illinois. Coquillett described this species as *Cordylura slossonae* from Massachusetts, and New Hampshire, and Cresson as *vicina* from Pennsylvania.

**Paralleloma dimidiata** Cresson.

In addition to the characters mentioned in the key this species differs from *pleuritica* in having the fore tarsi slightly broadened in both sexes and with fine hairs along the posterior margins, most noticeable on basal segment and in male.

Originally described from Pennsylvania. I took a male and female at Glen Echo, Maryland, July 2, 1922. The female was previously unknown.

**Paralleloma similata** sp. n.

Glossy testaceous yellow, with the upper part of occiput, posterior part of frons and dorsum of thorax darker; ocellar spot and two narrow, submedian, dorsal vittae on thorax blackish; abdomen varying from brown to fuscous. One male from New Hampshire has the

dorsum of the thorax almost entirely brownish black, and the abdomen except the hypopygial forceps and processes of fifth abdominal sternite similarly colored. Legs entirely yellow. Wings with the cross-veins and the tips of longitudinal veins at apex of wing slightly infuscated.

The mid and hind femora in male are rather long haired ventrally and have each one or two preapical black bristles on anteroventral surface. The female has no long hairs on the femora and the anteroventral bristles are farther from apex. Both the mid and hind femora in this sex have a very long, fine bristle at base on ventral surface and the mid and hind tibiae have each a preapical, ventral bristle. Posterior notopleural and prealar bristle both long. Processes of fifth abdominal sternite not longer than broad, with a small rounded emargination in apical margin, the surface almost bare, with a few hairs along the truncate part of lower margin.

Length, 7-8 mm.

*Type*, male, and *allotype*, Ottawa, Canada, May 15, in the author's collection. *Paratypes*, one male, Bretton Woods, New Hampshire, June 26, 1913; one female, Mt. Washington, New Hampshire, July 28, 1915, 2500 ft. (C. W. Johnson).

**Paralleloma munda** (Loew).

This species closely resembles *pleuritica* Loew and more especially the form in which the pleura are largely yellow, the color being almost identical except that the black streak on posterior part of pleura is either absent or very short in *munda*. The femora are also pale in both sexes. The processes of the fifth abdominal sternite in the males of the two species are very different, that of *munda* having a truncate part on lower margin which is about half as long as the process, and there are only a few hairs present which are confined to the anterior angle of the truncation on lower margin.

Originally described from Canada and since recorded from New Hampshire. I have taken it frequently in Illinois and it is common near Washington, D. C., in May, where it is the commonest species of the genus. I have also seen it from Quebec, Canada.

Both sexes have a color variety with a broad yellow dorsocentral thoracic vitta which extends over disc of scutellum.

**Paralleloma emarginata** sp. n.

In color similar to the vittate variety of *munda*.

The processes of the fifth ventral abdominal sternite of male differ very strikingly from those of *munda*, being a little longer than broad, of equal width to apex and with a broad rounded emargination at apex; the lower margin has a few hairs on apical half which extend onto the disc slightly.

Length, 7-8 mm.

*Type,* male, Auburndale, Massachusetts, August 2. *Allotype,* same locality, June 26. *Paratype,* Riverside, Massachusetts, May 22 (C. W. Johnson); Germantown, Pennsylvania, May 25, 1907 (Harbeck). In the collection of the Boston Society of Natural History.

**Paralleloma emarginata** var. **dorsalis** var. n.

Differs from the type form in having the dorsum of thorax glossy black, and the propleura and metapleura dull black. In other respects similar to type.

Length, 8 mm.

*Type,* Chain Bridge, Virginia, May 23 (N. Banks) in Mr. Banks' collection.

**Paralleloma banksi** sp. n.

♂.—Similar in color to the dark form of *pleuritica,* the dorsum of thorax and abdomen being wholly glossy black and the pleura almost entirely black. The processes of fifth abdominal sternite of male are almost entirely yellow. Legs yellow. Wings slightly browned at apices.

The mid and hind femora have fine, but not very long, ventral hairs and no distinct ventral bristles, and only the posterior hairs on mid tibiae are distinctly longer than the diameter of the tibiae. The processes of fifth abdominal sternite are longer than broad, their ventral margin almost straight and longer than the upper, the latter with a short rounded emargination near base.

Length, 7.5 mm.

*Type,* New York. From the Loew collection, labelled "sp. n. *munda* aff." In the Museum of Comparative Zoology, Cambridge, Massachusetts.

**Cordylura deceptiva** sp. n.

♀.—Glossy black. Face and bases of palpi cream colored, frontal orbits and frons and the narrow postocular orbits white pruinescent. Fore coxae, trochanters, and bases of all femora, entire fore tibiae, knees of mid and hind legs, and bases of tarsi yellow, the apices of fore tarsal segments black below. Tips of wings and the cross-veins infuscate.

Arista short, long plumose above and below. Posterior notopleural and prealar short, only the posterior pair of dorsocentrals distinct. Scutellum with 2 strong bristles. Fore femur with 4 or 5 posteroventral bristles on basal half; hind femur with 2 or 3 anteroventral bristles on apical half; mid tibia with the ventral bristle strong; hind tibia with 2 anterodorsal, 1 anteroventral, and 2 posterodorsal bristles. Outer cross-vein nearly twice its own length from inner; first vein bare.

Length, 7 mm.

*Type,* Henry, Michigan, August 27, 1919 (W. L. McAtee), in the United States National Museum.

Superficially closely resembles *Achaetella varipes* Walker.

# Undescribed Crane-Flies from Argentina (Dipt.: Tipulidae). Part VI.

By Charles P. Alexander, Amherst, Massachusetts.

The species described in the present installment were all collected by Dr. Charles Bruch in the Provinces of Buenos Aires and Córdoba. My deepest thanks are extended to Dr. Bruch for his co-operation in making known the interesting Tipulid fauna of Argentina. The types are preserved in the writer's collection.

**Molophilus honestus** sp. n.

Head yellowish; antennae of male rather short, dark brown; mesonotal praescutum brownish yellow, the median area indistinctly darkened; pleura pale with a conspicuous, brown, longitudinal stripe; halteres yellow; wings pale brownish, subhyaline; abdomen dark brown, the hypopygium and ovipositor yellowish; male hypopygium with the ventral appendage elongate, with a small acute spine on the ventromesal face near two-fifths the length, the apex of the blade slightly flattened and with close-set appressed teeth.

♂. Length 3.4-3.5 mm.; wing 4.6-4.7 mm. ♀. Length 4 mm.; wing 4.8 mm.

Rostrum testaceous; palpi dark brown. Antennae of the male rather short, if bent backward, not extending beyond the wing-root; antennae dark brown; flagellar segments elongate-oval with the long, black verticils; in the female, the flagellar segments are cylindrical or short-oval. Head pale yellowish, the vertex with conspicuous yellow bristles.

Pronotal scutellum conspicuously white. Mesonotal praescutum brownish yellow with an ill-defined, brownish, median area, the lateral margins whitish; interspaces with long, black bristles; scutum pale, the lobes brown; scutellum broad, pale yellow; postnotum brown. Pleura pale with a whitish bloom; dorsopleural membrane whitish; a broad, conspicuous, dark brown stripe extending from the cervical sclerites to the postnotum and base of the abdomen; mesosternum brown. Halteres light yellow.

Legs with the coxae and trochanters pale yellow; femora and tibiae brownish yellow; tarsi brown.

Wings pale brownish, subhyaline, the base a little more yellowish; veins pale brown; wing-apex slightly pointed. Venation: Deflection of $R_{4+5}$ about equal to *r-m;* basal deflection of $Cu_1$ about two-thirds the petiole of cell $M_3$; vein *2nd A* long, the distal end bent strongly toward the wing-tip.

Abdomen dark brown, the hypopygium obscure yellow. Male hypopygium with the ventral appendage very long and slender, extending almost to the ends of the pleurites, at about two-fifths the length, on

the ventro-mesal face, with a small, acute spine; the long apical point is slightly flattened near the tip, this apical blade with numerous appressed serrations. Ovipositor reddish horn color, the tergal valves rather strongly upcurved; sternal valves dark brown, slender, straight.

*Holotype:* ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype:* ♀. *Paratopotypes:* 2 ♂'s.

**Molophilus bruchi** sp. n.

Antennae pale brown; mesonotal praescutum obscure yellow, with three, broad, dark brown stripes; halteres with the knobs yellow; wings with conspicuous, brownish black hairs; abdomen brownish black; ventral appendage of male hypopygium shaped as broad-based simple horns.

♂. Length about 2.8-3 mm.; wing 3.7 mm.

Rostrum and palpi dark brown. Antennae pale brown, the basal segments light yellow; flagellum short, the segments cylindrical. Head grayish brown.

Mesonotal praescutum narrowly margined with whitish, the disk obscure yellowish brown with the humeral region brighter yellow, with three, broad, ill-defined dark brown stripes, the median stripe very narrowly and indistinctly split by a pale line; praescutal interspaces with conspicuous black and yellow setae; remainder of mesonotum dark brown. Pleura dark brown, gray pruinose. Halteres light brown, the knobs conspicuously light yellow.

Legs with the coxae yellowish brown; trochanters obscure yellow; remainder of the legs dark brown.

Wings pale brown with conspicuous, brownish black trichiae; veins rather pale.

Abdomen dark brownish black. Male hypopygium with the ventral appendage in the form of a conspicuous, curved, simple horn, broad basally, tapering gradually to the acute point. Pleural appendage slender, deeply branched, the dorsal arm slender, the ventral arm widened into a truncated blade. Gonapophyses flattened, near the base on the lateral margin with a conspicuous, laterally directed spine.

*Holotype:* ♂, Palo Blanco, La Plata, April 24, 1920 (C. Bruch). *Paratopotypes:* numerous ♂'s.

This interesting *Molophilus* is named in honor of the collector, Dr. Charles Bruch.

**Gonomyia (Progonomyia) saxicola** sp. n.

General coloration pale yellow, variegated with brown; male hypopygium with the intermediate appendage bifid, the outer branch appearing as a tiny spine at the base of the long inner branch.

♂. Length 4-4.2 mm.; wing 5.8-6 mm. ♀. Length 5.8 mm.; wing 6.2 mm.

Rostrum dark brown, sparsely pruinose; palpi dark brown. Antennae dark brown, the basal segment of the scape sparsely pruinose; flagellar segments elongate. Head broad, light gray, the center of the vertex suffused with light brown.

Pronotal scutum large and conspicuous, pale brownish yellow, heavily dusted with whitish pollen; scutellum dull yellow, the median area narrowly brown. Mesonotal praescutum pale brownish gray with four dark brown stripes, the intermediate stripes very closely approximated; pseudosutural foveae large and conspicuous, black; scutum brownish gray, the centers of the lobes darker; scutellum pale; postnotum dark brown, paler laterally, the pleurotergites conspicuously light gray pruinose. Pleura pale yellow, with a broad, brownish, longitudinal stripe extending from the cervical sclerites to beneath the wing-root; sternum largely dark brown. Halteres elongate, pale, the knobs brown.

Legs with the coxae obscure brownish yellow; trochanters dull yellow; femora and tibiae obscure brownish yellow, the tips of the latter narrowly and indistinctly darkened; tarsi brown.

Wings subhyaline; stigma small, short-oval, pale brown; veins pale brown. Venation: $Sc$ moderately elongate, $Sc_1$ extending to about one-third the length of $Rs$, $Sc_2$ far from the tip of $Sc_1$, a little before mid-length of that part of $Sc$ beyond the origin of $Rs$; $r$ at the fork of $R_{2+3}$, oblique in position, sometimes indistinct; $R_2$ straight, in alignment with and longer than $R_{2+3}$; cell *1st* $M_2$ open; basal deflection of $Cu_1$ at or before the fork of $M$.

Abdomen uniform brown, the sternites a little paler. Male hypopygium with the intermediate appendage darkened, conspicuous, two-branched, the lateral branch very tiny, appearing as a slender spine at the base of the long inner branch; this latter is slender, slightly curved, the tip suddenly narrowed into a short blunt spine; inner pleural appendage a slender, slightly curved spine; outer pleural appendage a fleshy lobe with the setae all on the mesal face, directed strongly backward to produce an hystriciform appearance. Penis-guard slender, narrowed to the simple apex.

*Holotype:* ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype:* ♀. *Paratopotypes:* numerous ♂'s and ♀'s.

**CRYPTOLABIS** Osten Sacken **PROCRYPTOLABIS** subgen. n.

Apical cells of wings entirely without macrotrichiae; cells $M_3$ and $Cu_1$ deep. Male hypopygium with four conspicuous digitiform lobes that surround a blackened, elongate, penis-guard. Ovipositor with the valves fleshy.

*Type of the subgenus: Cryptolabis (Procryptolabis) argentinensis* sp. n. (Neotropical Region).

**Cryptolabis (Procryptolabis) argentinensis** sp. n.

General coloration brownish black, dusted with gray; wings with a faint brownish tinge, the base yellowish.

♂. Length 3 mm.; wing 3.5 mm. ♀. Length 2.5-2.9 mm.; wing 4 mm.

Rostrum and palpi black. Antennae brownish black; flagellar segments oval, provided with a sparse white pubescence. Head dark gray; front and anterior part of vertex whitish; vertex between the eyes somewhat compressed into a median ridge.

Pronotum dark, the scutellum obscure yellow. Mesonotum brownish black, sparsely dusted with gray; an impressed, transverse line that extends from the pseudosutural foveae almost across the sclerite; remainder of the mesonotum black, sparsely dusted. Pleura brownish black, the dorso-pleural membrane obscure brownish yellow. Halteres light brown, the knobs pale.

Legs with the coxae dark brown; trochanters yellowish brown; femora brown, the bases obscure yellow, narrowest on the fore legs where only the bases are pale, broadest on the hind legs where only the tips are brown; tibiae yellowish brown, the tips darker; tarsi dark brown.

Wings with a faint brown tinge; wing-base yellowish; stigma very long and narrow, pale brown; veins dark brown. Venation: $Sc$ short, $Sc_1$ ending but a short distance beyond the origin of $Rs$, $Sc_2$ removed from the tip of $Sc_1$, lying proximad of the origin of $Rs$; $Sc_1$ longer than $Rs$; $Rs$ very short, straight, oblique, shorter than $R_{2+3}$; $r$ on $R_2$ about its own length belond the fork of $R_{2+3}$; deflection of $M_{1+2}$ very short, so $M$ is almost in alignment with $M_{1+2}$, the latter weak and without macrotrichiae on its basal third; basal deflection of $Cu_1$ about its own length beyond the fork of $M$; cells $M_3$ and $Cu_1$ deep, $Cu_2$ being about three times the deflection of $Cu_1$.

Abdomen brownish black. Male hypopygium surrounded by four flattened digitiform lobes; a central black penis-guard that is inserted far in the body, the base flattened, the middle portion deeply constricted. Ovipositor with the valves short and blunt, simulating the male hypopygium.

*Holotype:* ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype:* ♀, pinned with the ♂. *Paratopotypes,* 4 ♂ ♀'s.

**Limnophila platensis** sp. n.

Antennae dark brown; mesonotum yellowish brown, the praescutum with four, narrow, dark brown stripes; pleura yellow, with small, brown spots above the middle and hind coxae; halteres elongate; wings dusky, with small, brown spots, including a longitudinal series in cell $R$; cell $M_1$ present, long; abdominal tergites dark brown, margined posteriorly with yellow.

♂. Length 8.4-9 mm.; wing 9.5-10.6 mm. ♀. Length 10 mm.; wing 10 mm.

Rostrum brown; palpi with the basal segment light brown, the distal segments black. Antennae dark brown throughout, moderately elongate, the flagellar segments long-oval with the longest verticils on the dorsal surface. Head brownish yellow, the center of the vertex brown.

Pronotum dark brown medially, paler laterally. Mesonotal praescutum yellowish brown, with four, narrow, dark brown stripes, the intermediate pair narrowly separated, their anterior ends divergent; scutum broadly dull yellow medially, the lobes brownish testaceous; scutellum yellowish testaceous; postnotum with the posterior half yellow, the anterior half brownish. Pleura light yellow, sparsely pruinose; a conspicuous, brownish black spot at the base of the middle coxa; a smaller but similar spot at the base of the hind coxa. Halteres long and slender, dark brown, the extreme base of the stem paler.

Legs with the coxae and trochanters dull yellow; femora yellowish brown, the tips a little darker; remainder of the legs dark brown.

Wings with a dusky tinge; stigma not well-defined; small brown spots on the wing-surface, distributed as follows: A cloud at the origin of *Rs;* spots at tip of *Sc*, fork of *Rs*, fork of $R_{2+3}$, ends of $R_1$ and $R_2$; narrow seams along the cord and outer end of cell *1st* $M_2$; a large cloud in cell *Cu* near midlength; in addition, a series of from two to ten brown spots in cell *R*, rather equidistantly spaced, sometimes more or less confluent, resulting in a reduction in number; veins dark brown. Venation: $Sc_2$ at the tip of $Sc_1$, the latter ending opposite or slightly beyond the fork of $R_{2+3}$; *Rs* long, strongly angulate or sometimes spurred at origin; $R_{2+3}$ varying in length, sometimes longer than the deflection of $Cu_1$; *r* at tip of $R_1$; cell *1st* $M_2$ long and narrow; cell $M_1$ deep, two to three times as long as its petiole; basal deflection of $Cu_1$ some distance beyond the fork of *M;* vein *2nd A* very long, ending beyond the origin of *Rs*.

Abdominal tergites dark brown, the caudal margins of the segments narrowly and indistinctly yellow; two, small, yellow dots near midlength of the tergites; sternites more uniformly brownish yellow, the lateral margins at midlength more infuscated; hypopygium dark brown.

♀. Similar to the male but the wing-pattern is more clear-cut. Ovipositor with the tergal valves slender, upcurved.

*Holotype:* ♂, Palo Blanco, La Plata, April 18, 1920 (C. Bruch). *Allotopotype:* ♀, May 2, 1920. *Paratopotypes:* 5 ♂'s, April 18-24, 1920.

**Brachypremna australis** sp. n.

Frontal prolongation of the head and mouth parts light yellow; head light gray; mesonotal praescutum yellowish brown with two, intermediate, parallel, dark brown stripes; lateral stripes pale brown, each sending a brown line laterad to the margin of the sclerite; a conspicuous,

black, rounded spot at the pseudosutural foveae; tibiae and tarsi uniformly dark brown; wings light grayish yellow, the costal and apical region more saturated.

♂. Length 11.5 mm.; wing 13.3-13.5 mm. ♀. Length 14 mm.; wing 14.2-15.2 mm.

Frontal prolongation of head and the mouth parts conspicuously light yellow; palpi with the basal two segments dark brownish black, the distal segments paler brown. Antennae with the scapal segments light yellow, sparsely pollinose; flagellum dark brown, the basal two or three segments more brownish yellow. Head light gray, dusted with yellow.

Pronotum pale buff, with three brown markings, the median mark broadest. Mesonotal praescutum rather bright yellow to reddish brown, subshiny; three praescutal stripes, the broad median stripe almost of the ground-color, the margins conspicuously but narrowly dark brown, these markings ending before the suture; lateral stripes pale brown, from the anterior end of each a darker mark extends laterad to the margin of the sclerite; pseudosutural foveae small, rounded, black; scutum with the median area dull yellow, each lobe more grayish, with a V-shaped brown marking; scutellum yellow with a small brown spot in the center; postnotum brownish yellow with a brown longitudinal stripe on either side of the narrow median line. Pleura pale yellow, sparsely pruinose, the mesepisternum a little infuscated. Halteres yellow, the knobs pale brown.

Legs with the coxae pale, the middle coxae with a rounded dark brown spot on the cephalic face, the posterior coxae with a slightly larger spot on the outer face; trochanters dull yellow; femora brownish yellow, the tips narrowly dark brown; tibiae and tarsi uniformly dark brown.

Wings light grayish yellow, the costal region more saturated yellow; apex slightly darkened; stigma yellow, narrowly encircled with brown; some of the longitudinal veins narrowly seamed with darker, clearest at the tips of $R_4+_5$ and $M_1$. Venation: *r-m* very short or obliterated by the punctiform contact of $R_4+_5$ on $M_1+_2$; vein *2nd A* very short.

Abdominal tergites yellowish brown, the subterminal tergites darker, almost black; lateral margins of sclerites narrowly grayish; sternites with elongate-oval black marks; male hypopygium light yellow. In the female, the abdomen is uniformly light brown, but the basal tergite shows two parallel darker longitudinal stripes.

*Holotype:* ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype:* ♀. *Paratopotypes:* several of both sexes, some in alcohol.

*Brachypremna australis* is the most southerly representative of the genus yet made known. In the venation and uniformly darkened tibiae and tarsi, it agrees only with the Amazonian *B. uniformis* Alexander, from which it differs conspicuously in its yellow mouth parts and conspicuous thoracic pattern.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JUNE, 1923.

## The Worthy Flea.

In years gone by more than one entomological journal has drawn remarks appropriate to our science from the writings of Oliver Wendell Holmes. Another source, also of high literary quality, for critiques of the study, and of students, of insects is to be found in *Enjoying Life and Other Literary Remains* of W. N. P. Barbellion. Barbellion was the pen name of Bruce Frederick Cummings, for five years on the entomological staff of the British Museum, the brief announcement of whose death is to be found in the NEWS for May, 1920, page 149. One of his delightful essays is entitled *The Scarabee Monographed,* published originally in *The Forum* and reprinted in *Enjoying Life.* Here is a bit that will surely whet the reader's appetite for more:

> Recollecting, perhaps, the sentiment expressed by Boyle, that nothing can be unworthy of investigation by man that was not unworthy of being created by God, a member of the wealthy Rothschild family is at the present moment the foremost authority on the Siphonaptera, a name which polite students give to the fleas. In the lay mind the flea is only a joke—and always one which must be cracked. But, "pour les vrais savans," he is a serious and very attractive study in comparative anatomy, bionomics and metamorphosis. Even lice have never lacked students. Henry Denny monographed the British species as early as 1842. The "Monographia Anoplurum Britanniae" is a very curious old book, concluding with a quotation from the 91st Psalm: "These all wait upon Thee that Thou mayest give *them* their meat in due season."

## Cellucotton for Packing Unmounted Insects.

During the summer of 1919 the writer began using cellucotton as a substitute for glazed cotton, for packing unmounted insects as collected in the field. This material has been used each year since, and with evident satisfaction on the part of all who have tried it. For entomological purposes cellucotton has been found superior to glazed cotton on the following counts: thick layers may be cut easily with scissors to fit any container; the material may be separated readily into layers of any desired thickness at the moment of using; there are no fibers to cling to the insects such as may occur when using cotton.

Cellucotton is a woodpulp product, apparently developed during the war period as a substitute for cotton in all its uses as an absorbent material and for surgical dressings. For those purposes it is excellent, but cellucotton is now being put to other uses where soft thin layers are required, such as packing for delicate glassware or unmounted insects. This material may now be obtained in rolls 24 inches wide and weighing approximately 17 pounds. A recent quotation gave the price as 23 cents per pound, and it takes a considerable volume to make a pound. The roll may be unwound into a layer one inch thick, and this in turn, if desired, be separated into thin sheets little thicker than lens paper. Cellucotton may now be obtained from most wholesale drug firms, although the chief distributing agency appears to be the Lewis Manufacturing Company, Walpole, Massachusetts.—HARRY H. KNIGHT, University of Minnesota.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record. Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **13**—Journal of Entomology and Zoology, Claremont, Cal. **16**—The Lepidopterist, Salem, Mass. **24**—Annales de la Societe Entomologique de France, Paris. **50**—Proceedings of the United States National Museum. **71**—Novitates Zoologicae, Tring, England. **72**—The Annals of Applied Biology, London. **76**—Nature, London. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **78**—Bulletin Biologique de la France et de la Belgique, Paris. **82**—The Ohio Journal of Science, Columbus, Ohio. **89**—Zoologische Jahrbucher, Jena. **95**—Annales des Sciences Naturelles, Zoologie, Paris. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **106**—Anales de la Sociedad Cientifica Argentina, Buenos Aires. **109**—Annales Historico-Naturales Musei Nationalis Hungarici, Budapest. **111**—Archiv fur Naturgeschichte, Berlin. **114**—Entomologische Rund-

schau, Stuttgart. **138**—American Museum Novitates, New York. **139**—Bulletin of the Southern California Academy of Sciences, Los Angeles. **143**—Stettiner Entomologische Zeitung.

**GENERAL.** **Browne, H. B.**—"Window" envelopes [for papered specimens]. **9,** lvi, 92-3. **Gahan, A. B.**—The role of the taxonomist in present day entomology. **10,** xxv, 69-78. **Howes, P. G.**—Photographing insect life. (Nature Mag., May, 1923, 9-14.) **Littlewood, F.**—Killing with cyanide. **9,** lvi, 90-2. **Lutz, F. E.**—Flowers and their insect visitors. (Nat. Hist., New York, xxii, 125-34.) **McCulloch & Hayes**—The reciprocal relation of soil and insects. (Ecology, iii, 288-301.) **O'Hea, J. P.**—Tactile vision of insects and arachnida. **76,** cxi, 498. **Phisalix, M.**—Animaux venimeux et venins. Tome I. Masson & Cie., Paris, 1922.

**ANATOMY, PHYSIOLOGY, ETC.** **Rabaud, E.**—Recherches sur la variation chromatique et l'homochromie des arthropodes terrestres. **78,** lvii, 1-69.

**ARACHNIDA AND MYRIOPODA.** **Mello-Leitao**—Quelques Araignees nouvelles ou peu connus du Bresil. **24,** xci, 209-28.

**Chamberlin, R. V.**—The No. American species of Mimetus. **13,** xv, 3-9. **Ewing, H. E.**—The dermanyssid mites of North America. **50,** lxii, Art. 13.

**THE SMALLER ORDERS OF INSECTA.** **Campion, H.**—On the use of the generic name Brachycercus in Plectoptera and Orthoptera. **11,** xi, 515-18. **Durken, B.**—Die postembrionale entwicklung der trachenkiemen und ihrer muskulatur bei Ephemerella ignita. **89,** xliv, Anat., 439-626. **Ewing, H. E.**—New genera and species of sucking lice. (Jour. Wash. Ac. Sci., xiii, 146-9.) **Kennedy, C. H.**—The naiad of Pantala hymenaea (Odonata.) **4,** lv, 36-8. The ecological relationships of the dragonflies of the Bass Islands of Lake Erie. (Ecology, iii, 324-36.) **Kruger, L.**—Psychopsidae. Beitrage zu einer monographie der Neuropteren-familie der Psychopsiden. Berothidae. Beitrage zu einer monographie der Neuropteren familie der Berothiden. Hemerobiidae. Beitrage zu einer monographie der Neuropteren-familie der Hermerobiiden. **143,** lxxxiii, 17-48; 49-88; 138-72.

**McDunnough, J.**—New Canadian Ephemeridae with notes. **4,** lv, 39-50.

**ORTHOPTERA.** **Campion, H.**—(See under Smaller Orders.) **Caudell, A. N.**—A new sp. of Zoraptera from Bolivia. **10,** xxv, 60-2. **Fontes et Veloso.**—Sur lest mouvements automatiques des muscles des pattes de Blatta germanica. **77,** lxxxviii, 835-37.

**HEMIPTERA.** **Davidson, J.**—Biological studies of Aphis rumicis. The penetration of plant tissues and the source of the food

supply of aphids. **72**, x, 35-54. **Dudich, E.**—Die Phymatiden des Ungarischen national museums. **109**, xix, 161-81. **Gerhard, W. J.**—The periodical cicada. (Field Mus. N. H., Leafl. 4.) **Parshley, H. M.**—On the ecology of Podops cinctipes and Rhytidolomia saucia. **4**, lv, 69-71.

**Hungerford, H. B.**—Some studies on the genus Hydrometra in America, north of Mexico, with description of a n. sp. **4**, lv, 54-8.

**LEPIDOPTERA. Ainslie, G. G.**—A corn-feeding geometrid (Pleuroprucha insulsaria.) **82**, xxiii, 89-101. **d'Almeida, R. F.**—Notes sur quelques lepidopteres Rhopaloceres du Bresil. **24**, xci, 229-35. **Bowman, K.**—Annotated check list of the Macrolepidoptera of Alberta. **4**, lv, 71-2. **Coolidge, K. R.**—Notes on California moths. **139**, xxii, 16. **Jordan, K.**—On the sensory organ found on the head of many lepidoptera. On the scent-organs in the males of certain American Castniidae. A note on the families of moths in which vein 5 of the forewing arises from near the center or from above the center of the cell. **71**, xxx, 155-8; 159-62; 163-66. On the comb-bearing flap present on the fourth abdominal segment in the males of certain Notodontidae. **71**, xxx, 153-57. **Littlewood, F.**—(See under General.) **Mousley, H.**—Erora laeta Edwards. **4**, lv, 26-9.

**Cassino & Swett**—Some new Geometridae. **16**, iv, 1-8. **Hill, C. A.**—A new sp. and a new var. of noctuid moths from Southern California. **139**, xxii, 17-19.

**DIPTERA. Becker, T.**—Dipterologische studien. Dolichopodidae. B. Nearctische und Neotropische region. (Abh. Z. B. Gesell. Wien, xiii, 1-294, 1921.) **Duda, O.**—Revision der altweltlichen arten der gattung Borborus (Capsela.) **111**, 1923, A, 4, 35-112. **Greene, C. T.**—The immature stages of Hydrophorus agalma. **10**, xxv, 66-9. **Surcouf, J. M. R.**—Dipteres nouveaux ou peu connus. **24**, xci, 237-44. **Tonnoir, A.**—Le cycle evolutif de Sactylocladius commensalis sp. n. Chironomide a larve commensale d'une larve de Blepharoceride. (An. Biol. Lacustre, xi, 279-91.)

**Curran, C. H.**—Our No. American Leucozona, a variety of lucorum (Syrphidae.) **4**, lv, 38. The Stenosyrphus sodalis group (Syrphidae.) An apparently undescribed species of Scellus (Dolichopodidae.) Change of names. **4**, lv, 59-64; 73-4; 74. **McAtee, W. L.**—Descriptions of Bibio from the Carolinas. **10**, xxv, 62-4.

**COLEOPTERA. Brethes, J.**—Descripcion de varios coleopteros de Buenos Aires. **106**, xciv, 263-305. Primera contribucion para el conocimiento de los "Strepsiptera" Argentinos. Apendice. Hymenoptera. (Rev., Facult. La Plata, xv, 41-56.) **Bridwell, J. C.**—The host plant and habits of Acanthoscelides griseolus. **10**, xxv, 79-80. **Buchanan, L. L.**—The European Amalus haemorrhous, in

the U. S. **10,** xxv, 79. **Cameron, M.**—Descriptions of new species of Staphylinidae from the West Indies. **11,** xi, 363-400. **Kleine, R.** —Bestimmungstabelle der gattung Arrhenodes. **111,** 1923, A, 4, 169-80. **Kriesche, R.**—Zur kenntnis der Lucaniden. **143,** lxxxiii, 115-37. **Mueller, R.**—Ueber die sinneszellen im fuhler von Necrophorus vespillo. **114,** xl, 9-10. **Notman, H.**—A new genus and sp. of Staphylinidae parasitic on a S. American opossum. **138,** No. 68. **Schenkling, S.**—Coleopterorum catalogus. Pars 76: Cryptophagidae. **Scott, H.**—Longevity of a cerambycid larva. **8,** 1923, 90.

**HYMENOPTERA. Brethes, J.**—(See under Coleoptera.) **Cockerell, T. D. A.**—Some bees from British Guiana. **11,** xi, 412-59. Some bees from Victoria, Mexico. **50,** lxiii, Art. 8. **DuBois, A. D.** —A study in ant-power. (Nature Mag., May, 1923, 8.) **Gahan & Fagan**—The type-species of the genera of Chalcidoidea or chalcid-flies. (Bul. U. S. Nat. Mus., 124.) **Santschi, F.**—Description de nouvelles fourmis de l'Argentine et pays limitrophes. **106,** xciv, 241-62. **Sarin, E.**—Ueber fermente der verdauungsorgane der honigbiene. (Biochem. Zeit., Berlin, cxxxv, 59-84, 1922.) **Stumper, R.**— L'establissement des nouvelles colonies chez les fourmis. **95,** vi, 95-105. **Vogel, R.**—Zur kenntnis des feineren baues der geruchsorgane der wespen und bienen. **104,** cxx, 281-24.

**Fouts, R.**—Description of a new Serphoid parasite. **10,** xxv, 64-5. **Gahan, A. B.**—An Eulophid parasite of the chrysanthemum midge. **10,** xxv, 65-6. **Macgillivray, A. D.**—New western species of Dolerus. **4,** lv, 65-8.

---

RESPONSES OF THE LARGE WATER-STRIDER, GERRIS REMIGIS SAY, TO CONTACT AND LIGHT by C. F. CURTIS RILEY (Annals Ent. Soc. Amer. vol. XIV, No. 4, pp. 231-289).—Insect behavior receives so little attention from entomologists in general that it seems desirable to call attention to Prof. Riley's paper. It is probably difficult for economic entomologists to see any intimate relationship between insect control and many of the reactions produced by the work of complex external and internal forces, and collectively called behavior. However, a better understanding of the forces which call forth responses from living matter might lead to new methods for use in the economic field. The study of insect behavior calls for careful work in the laboratory and field on account of the various factors involved and the possibility of drawing wrong conclusions from too few, or wrongly correlated, data or failure to take physiological conditions into account. Prof. Riley's paper deals with the general responses to contact and light of *Gerris remigis,* one of the common species of aquatic Heteroptera, which lives usually on water-films of medium-sized permanent brooks and creeks. He found that the species responded readily to contact stimuli from

various objects in its habitat and that variations in responses took place when the stimuli were similar and general conditions were unchanged. These variations he states are probably due to different internal conditions at different times. Of course this is not a satisfactory explanation of such variations, but no other course was open to Prof. Riley in view of the absence of data and the difficulty of studying differences due to changes in the internal condition of the insects. The grouping of the animals, commonly in the fall, through contact stimuli and the various factors bearing on such aggregations and their later disintegration are discussed in an interesting manner, as are also the effects of severe droughts, rain and wind storms. It appears that responses to contact stimuli are strongly in evidence at the beginning of and during the hibernating period. So far as photic stimuli are concerned, *Gerris remigis* responded readily to various intensities. On certain occasions in laboratory aquaria it acted negatively phototactic to sunlight. To the stimuli of electric lights of 22 ca. m. and 44 ca. m., Prof. Riley found that the majority of the gerrids responded positively, the orientations and movements being less pronounced when light of lesser intensity was used. Stationary, oscillating and moving but not oscillating lights were used in the experiments. The author covers the habitat responses to sunlight only to a small extent but a later paper on this subject is promised. He concludes "that responses to contact and to photic stimulation play an important rôle in the daily lives of the water-striders," many of the normal habitat activities being due to the thigmotactic and phototactic propensities of the insects. The work of other investigators is reviewed throughout and the paper is accompanied by 12 figures, most of them being photographs of field conditions. These illustrations did not gain anything by being printed on the same kind of paper as the text.—HARRY B. WEISS, New Brunswick, N. J.

## OBITUARY.

I have recently heard that Dr. R. A. DUMMER, the distinguished botanist and collector, is dead. In the Report of the South African Museum for the past year there is a note by Dr. Péringuey, as follows:—"I much regret to say that I have received news of the death, by accident, of this collector." Since Dr. Dummer has advertised so extensively in "Entomological News," and undoubtedly has many correspondents in America who are awaiting news of him, I thought that it might be desirable to publish a brief statement to this effect.

CHARLES P. ALEXANDER.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXIV — JULY, 1923 — No. 7

CONTENTS



# Life-Histories in the Genus Schinia and Allies (Lepid.: Noctuidae) No. 1.

By HENRY BIRD, Rye, New York.

To students and collectors of the Noctuidae, that aggregation of forms which figured in the days of Grote as the "Heliothini" possessed an interest that called to them more than passing note, and they were favorite species with Henry Edwards, Strecker, Grote and Smith, while the work and summarization by Barnes and McDunnough have doubtless provided a compilation of nearly all the representatives of our fauna.

Though the tribal lines laid down by Grote for this grouping which had the old Ochsenheimer genus *Heliothis* as its type is not retained, and their phylogenetic position has been greatly and very properly changed by Hampson, their genera yet form a very distinct aggregation in American lists leading up to the Agrotid types, with which we are wont to associate the heavily spinose tibiae and other features of taxonomic degree.

Referring particularly to the genus *Schinia* Hb. and its near

ally *Lygranthoecia* G. & R., where a preponderance of the species occur, we now have a series of eighty-four accredited names, with their metropolis indicating a southern or southwestern center of dispersal. Such forms as are common to the Atlantic seaboard have long been familiarly known as adults, but even these, with one exception, it seems, are a perfect blank as to published data concerning their larval histories. Of the greater bulk of western and southwestern species less might be expected and no full description of a larval history has come to our notice.

All these species have a similar larval habit probably in feeding on flower-heads, seed-pods, seeds or ovules, are presumably single-brooded, gaining maturity at a rather late date in the season, so late in many instances that the usual collector of lepidoptera has given up all thought of securing larvae. With such habits some of them might readily become troublesome pests, upon undue increase in their numbers whereby an extension of food requirements proved imperative.

The adults are active moths for their size, may at times make an extended flight, as is indicated in the occasional appearance at the latitude of New York City of more southern forms, sometimes in considerable numbers.

Because of a short adult, egg and larval period in late midsummer and fall, with a major portion of their cycle passed as an underground pupa, they suffer less than some others from that scourge of insect life nowadays—fire. The moths fly readily to light, are to be found resting upon flower-heads or may be seen flying in afternoon hours, apparently feeding upon the nectar furnished by the current, seasonal bloom, which is also being patronized by bees. When the females are resting on flower-heads by day, it is natural to assume they may be associated with their foodplant, and it would appear there is considerable similarity in the color of the foodplant bloom and the predominating hues of the insect.

Doubtless many observations have been made which would help in elucidating the larval associations in this direction, but in being considered of small moment, they have not been

recorded to any extent. So, though the following notes are lamentably incomplete, in view of the facts, no excuses are offered.

**Schinia nundina** Dru.

On October 12, 1915, my son Junius discovered a mature larva feeding on Goldenrod bloom in a local woodland, and assuming it might be a *Schinia*, pains were taken to check the outcome, which ultimately registered a *nundina* emergence the following season. In the interval since this chance meeting, a yearly outlook has been maintained, with but five or six larval examples detected. One reason for poor success results from the great mass of *Solidago* bloom that decks the countryside, another is that the insect is rather uncommon at this location and finally, the close mimicry of the flower-head they occupy, makes the apprehension of these larvae difficult indeed. So far only *Solidago canadensis* L. seems the preferred one, but we assume this may be a mere chance, incidental to the fact that some examples of *canadensis* from favorable positions bloom earliest and thus happen to be selected by the females at the time of their flight.

The early stage larva likely mines the individual, unexpanded florets, feeding upon the tender ovules and stamens; later it remains in full exposure on the flower-head, solitary and sphinx-like, except that the retracted head and thoracic segments instead of being elevated, are curled under and bent to one side to avoid the stem whereon it has foothold. The yellow body color is similar in hue to the flower and a series of blackish, obliquely transverse markings on each segment correspond, in the full-grown larva, to the interstices between the florets of the flower-head, so that a striking resemblance to its surroundings exists. In curling the head downward there is a duplication of the frequency of the terminal ends of the infloresence to curl under, so this unusual attitude happens, or would seem, to have a clear purpose for protective results.

The feeding is confined to one flower, but the larvae move to several during their later career, and a clew to their whereabouts comes through noting the damaged flowers with their

prematurely expanding pappus, showing where the seeds have been partially cut. It is the seeds that are desired, apparently at all times, such other eating of the bloom being secondary to getting access to them.

The apprehension of larvae of this type is not easy at best and it appears the females oviposit most frequently on the food-plant where it occurs in a narrow fringe, as the borders to a road or pathway, rather than selecting a great expanse of the plant. It may be a coincidence, but roads running east and west and furnishing such borderings, also the southerly side of waste lands where conditions are favorable, have been the situation where these and allied larvae were most frequently met. An explanation may offer that with the prevalent southerly winds of mid-summer the bulk of adults are moving in a northerly direction. With *nundina* the larval period is assumed to be about twenty days.

*Larva, penultimate stage*: Head normal, smooth, rounded, concolorous, of dull orange hue, the minute ocelli showing as black dots; setae weak; width of head 2 mm. Body cylindric, surface of skin minutely granular but without pile; setae weak, their position is generally indicated by blackish plates but IIIa on the abdominal segments is indeterminate, and due to the granulations, all are indistinctly shown; the leg plate bears a crinkled glistening hair which rather exceeds the others. The crochets of the fourth abdominal prolegs seem to number twenty. The cephalic shield is wider and paler than the head, is slightly elevated from the adjoining surface or hooded, thus permitting a better retraction of the head; on its anterior margin, two black markings are behind the vertex of the frontal lobes, and the lateral edge has a black margin. The general body color is dull yellowish, sometimes with an olive tinge, deepening to dull orange on the dorsum; a broken dorsal line is indicated and a transverse dorsal banding occurs on the anterior portion of each joint, obliquely continued laterad and finishing at the posterior suture above the line of tubercles III and IV, where it blends with a vague spiracular shading, all the marking being contrastingly shown in black. Length 18 mm.

*Mature Larva*: Similar to preceding stage; color a brighter chrome yellow, fully matching the flower; markings of same pattern and intensity. Length 26 mm. Maturity Oct. 10-15.

The *pupa*, in comparison to the larva, seems very short and small but shows the necessary conformity to the adult. The abdominal joints are retracted, conic, rigid; color, olivaceous brown and not shining like the

common noctuid pupa. A subterranean cell is formed at a depth of six centimeters or more and there is the long pupal period from mid-October to the following August. No parasitism was observed.

**Schinia arcigera** Gn.

This is the commonest species in the appearance of the adults at light in this locality, but the larva seems equally scarce as *nundina*. It is a week later in appearing and in flight about the late summer flowers, there has been no preference detected to suggest what might be the foodplant. Our meeting with the larva has only been in the last stage, with *Aster puniceus* L. and *A. laevis* L. alone concerned as foodplants.

This larva, when resting, leaves the flower and stretches to full length immediately below the inflorescence on some straight portion of the stem. When feeding, the individual floret is consumed from the side to get at the ovules, while the body, except the head and first segments, is closely appressed to the stem below. In its case there are no transverse markings and the even body color of mars brown blends rather well with the surroundings, as frequently the Aster stems take on a purplish brown tone.

An unexpected feature exists in it being a pilose larva, which was to the writer a distinct surprise.

*Mature Larva:* Head polished, round, comparatively small, a dull shade of orange tinged with brown; on the top of either epicranial lobe and near the median suture appears a brown marking, and a close examination shows the head to be checkered with fine reddish lines. The front is higher than wide, with the suture dividing the adfrontal space a straight line, and the latter area a mere linear delineation. Width of head 1.5 mm.

The last two segments taper sharply, and in life a noticeable flattening exists, which is lost in the inflated larval skin. The body, though shining and seemingly naked, is found to be covered with a thick pile, the hairs of which are about one-eighth the length of the usual setae arising from the tubercles. Under magnification they are shown to be stiff brownish hairs. The body color is an even shade of pale mars brown, on close inspection found to be mottled and streaked with fine yellowish hair lines, while a well evident, pale yellow, subspiracular longitudinal line, occurs as the chief marking. The cervical shield is prominent, longitudinally marked with two lines composed of black bands split by a yellow line, which in a way are continuations of the head markings. The spiracles are solidly black, the tubercles concolorous

and indeterminate. The hooks of the prolegs number twenty, and the larva attains a length of 26-27 mm. One larva was noted mature and entered the ground Oct. 20.

The *pupa* and its conditions conform to the details given for the preceding species.

**Lygranthoecia brevis** Grt.

The association of this moth with the common purple Aster, *Aster novae-angliae* L., where its markings were pointed out to so admirably blend with the flower, has been chronicled by Beutenmüller and others for this section, while Cockerell has noted the species resting on the discs of *Helianthus lenticularis*, at Boulder, Colorado.

The pattern and lines in the adult of this species exhibit the basic principles of optical illusion, and it would appear to the writer that the caterpillars show delineations which are even a greater success in the art of camouflage. While the adult in rare instances has been noted in abundance about flowers, but few have ever been taken at Rye, whereas its larva may be found here abundantly when one is conversant with the procedure. An extended time, in which the larvae attain maturity, is noticeable, and in some seasons the first week of November is not too late to secure them. *Aster novae-angliae, A. laevis* and *A. puniceus* serve as foodplants, with the first best adapted to this sturdy caterpillar.

As this stout larva is noted at maturity, lying in crescent form on the denuded receptacle and more or less hidden by the pappus, it is apparent here must be a close relative of a cutworm of the Agrotid type and we see ample confirmation of Hampson's interpretation of the taxonomic characters of the adult, with the radical change he instituted over its earlier list position.

When feeding on the inflorescence of the New England Aster, the first three larval stages are passed within the full-formed flower bud and though it never opens, the damaged ovules send out some premature pappus, advising of the culprit. Two other larvae, a coleopter and micro-lepidopter, are busy here also and their work is very similar in this respect.

Having consumed the ovules in the full-formed bud, the final larval stages are passed on the upper surface of the expanded

flower, the seeds of several being required. Digging under the seeds where they find attachment, the larva succeeds in hiding to a remarkable degree and as this action causes a premature expansion of the pappus, there is soon this characteristic puff, helping concealment. But this is an evanescent screen and the larval markings in dashes and obliques of brown on a drab surface help admirably to fit in with its surroundings, as from its increasing size it must come into fuller exposure.

A parasitic Tachinid fly finds them out, however, and its actual oviposition has been observed on several occasions. One or more pearly white eggs are glued to an attacked host at any point of vantage by the female fly, whose actions are very deliberate, due perhaps to the coolness of the late autumn days or to the functional processes of oviposition. These parasitic larvae doubtless come to rapid maturity and pass the winter as puparia, since oviposition may be as late as October 20. Through the courtesies of the U. S. National Museum, this fly has kindly been determined by Dr. J. M. Aldrich as *Winthemia quadripustulata* Fab.

Local records for the moth cover the first ten days of September, when it is flying in company with *S. arcigera*.

*Larva, penultimate stage*: Head proportionately small, polished, rounded, the epicranial lobes topped with conspicuous blackish shading; width 1.5 mm. Body covered with fine pile, cylindrical, constricted at segmental sutures, longitudinally lined with numerous brown and fine, crinkled, yellow lines, of which the dorsal and spiracular are prominent, the former dark brown, the latter pale yellowish; underlying shade is sienna brown to pale clay color. Much variation exists in the coloration and the continuity of the lines. Cephalic plate wider than head and marked with four, conspicuous, slightly oblique, black lines. Tubercles indeterminate, IV discernible on abdominal joints, while the leg plate is readily seen; anal plate small and segment reduced. Length 20 to 21 mm.

*Mature Larva*: Similar to preceding stage, except the color is lighter and the lines are frequently broken at the segmental sutures, which latter produces an effect whereby the larva more closely simulates its surrounding bed of pappus. Width of head, 1.6 mm.; length of body, 28 to 30 mm. Maturity at Rye, N. Y., Oct. 20 to Nov. 8.

The *pupa* agrees with the preceding species in its proportionately reduced size, rigid conic abdominal region, and the subterranean cell as a consequence seems large as compared with the usual Noctuid condition.

# Notes on Zygoptera (Odonata) from Maryland, with a Description of Enallagma pallidum, n. sp.

By Francis Metcalf Root, Ph.D., Baltimore, Maryland.

During the summer of 1922 I visited various bodies of water in eastern Maryland in the course of a study of the breeding places of Anopheline mosquitoes. Finding that I had some spare time at my disposal, I turned my attention to the Odonata, but since my time was limited, I was forced to neglect the larger, swift-flying dragonflies to a considerable extent, and spend most of my time in collecting the Zygoptera or damselflies. The records listed in this paper are fragmentary, extending over only a part of the season and including only a few visits to each locality, but even so they are of considerable interest, especially since comparatively little has been published on the Odonata of Maryland.

From the physiographic standpoint, the localities where collections were made can be conveniently classified as follows:

1. Small, rapid streams.

Gwynn's Falls—a small stream just west of Baltimore, running through Hillsdale and Windsor Hills before entering the city itself. Visited May 30, June 23, 29, July 5, 10, Aug. 1, 16, 22, 30, Sept. 5, 9, Oct. 6, 24.

Herring Run—a small stream north-east of Baltimore running through an area reserved as a park. Visited July 21.

Small Streams with a similar fauna were also incidentally noted at Glenburnie, Homewood, Lake Roland and Ten Hills.

2. Sphagnum bogs.

Beltsville—the Powdermill Bogs, about two miles west of Beltsville, between Baltimore and Washington. Visited June 10.

Glenburnie—a pitcher-plant bog near the town, on the Annapolis Short Line, between Baltimore and Annapolis. Visited June 22.

3. Small, artificial ponds.

Homewood—several small ponds on the grounds of the Johns Hopkins University. Visited July 3, Aug. 9.

Hillsdale—north-west of Baltimore. A small pond resulting from the disuse of an old mill-race. Visited June 23, July 5, 10.

Columbia Ave.—several small ponds in a disused brick-yard in south-west Baltimore. Visited June 12, July 15.

4. Large ponds and lakes (mostly artificial).

Glenburnie—a large boggy pond formed by the damming of Sawmill Creek. About one mile north-east of the sphagnum bog already mentioned. Visited Aug. 4.

Ten Hills—a large pond about four miles west of Baltimore. Formed by damming a branch of Dead Run. July 24.

Lake Roland—a large lake, a reservoir of the water-supply system, about four miles north of Baltimore. July 13, 17.

Salisbury—in Wicomico County, on the Eastern Shore. Collecting was done at three mill-ponds north and north-east of the town, formed by damming the Wicomico River. Visited June 15, July 26, 27.

5. Brackish water ponds and bays.

Sparrows Point—seven miles south-east of Baltimore. Collections made in a bay of Jones Creek. July 6, 7.

Magothy River—Collections were made along the shore of the river near its mouth and in a large brackish pond connected with the river. The locality is about five miles north of Annapolis. July 31, Aug. 15, 21, 29. Sept. 4.

The following list gives the species of damselflies which were encountered, followed by the description of a new species.

AGRION MACULATUM Beauvais.—Common at all small streams visited between June 23 and Oct. 24.

HETAERINA AMERICANA Fabr.—First seen at Herring Run, July 21. Common at Ten Hills, July 24, and at Gwynn's Falls from July 29 to Oct. 24.

LESTES FORCIPATUS Ramb.—Homewood, Aug. 20, several specimens.

LESTES RECTANGULARIS Say.—Found near all small ponds from June 12 to Aug. 9.

LESTES VIGILAX Hagen.—Salisbury, July 27, one male.

ARGIA APICALIS Say.—Common about small streams (Gwynn's Falls, Herring Run, Ten Hills) and large ponds (Salisbury, Ten Hills, Lake Roland) on all visits between June 15 and Sept. 9.

ARGIA BIPUNCTULATA Hagen.—Common at sphagnum bogs (Beltsville, Glenburnie).

ARGIA MOESTA PUTRIDA Hagen.—Fairly common along small streams on all visits between June 29 and Oct. 24.

ARGIA SEDULA Hagen.—Common along Gwynn's Falls, June 23 to Sept. 9.

ARGIA TRANSLATA Hagen.—Not rare at Lake Roland, July 13 and 17.

ARGIA VIOLACEA Hagen.—Next to *Ischnura verticalis*, the most widely-distributed damselfly in this area. Found along small streams (Gwynn's Falls, Herring Run, etc.), small ponds (Homewood, Hillsdale), large ponds (Salisbury, Ten Hills, Lake Roland) and even near brackish water (Magothy River) from June 15 to Oct. 24.

ENALLAGMA ASPERSUM Hagen.—At small ponds, Homewood, July 3, Aug. 9, and Hillsdale, July 10.

ENALLAGMA CIVILE Hagen.—Large ponds, Salisbury, June 15, and Ten Hills, July 24.

ENALLAGMA DURUM Hagen.—Very common about brackish water on all visits.

ENALLAGMA EXSULANS Hagen.—Common along small streams on all visits between May 30 and Sept. 9.

ENALLAGMA GEMINATUM Kellicott.—Common about large ponds at Glenburnie (Aug. 4) and Salisbury (June 15, July 26-27).

ENALLAGMA HAGENI Walsh.—Small pond, Hillsdale, June 23, one male.

ENALLAGMA PALLIDUM new species.—Salisbury, July 26, one pair in copula and one male.

ENALLAGMA VESPERUM Calvert.—Salisbury, July 26-27, several specimens.

ENALLAGMA SIGNATUM Hagen.—Salisbury, June 15, July 26-27, Sparrows Point, July 6-7, and Magothy River, all visits.

ENALLAGMA TRAVIATUM Selys.—Not uncommon, Salisbury, June 15, July 26-27.

TELAGRION DAECKII Calvert.—One male, Salisbury, July 26.

NEHALENNIA GRACILIS Morse.—Sphagnum bog at Glenburnie, June 22, fairly common.

AMPHIAGRION SAUCIUM Burm.—Common at sphagnum bogs (Glenburnie, June 23 and Beltsville, June 10).

ISCHNURA POSITA Hagen.—Homewood, Aug. 9. Common at large ponds at Glenburnie, Aug. 4, and Salisbury, June 15, July 26-27.

ISCHNURA RAMBURII Selys.—Common at Magothy River on all visits.

ISCHNURA VERTICALIS Say.—Common about all small streams, small ponds, and large ponds from June 15 to Sept. 9.

**Enallagma pallidum** new species.

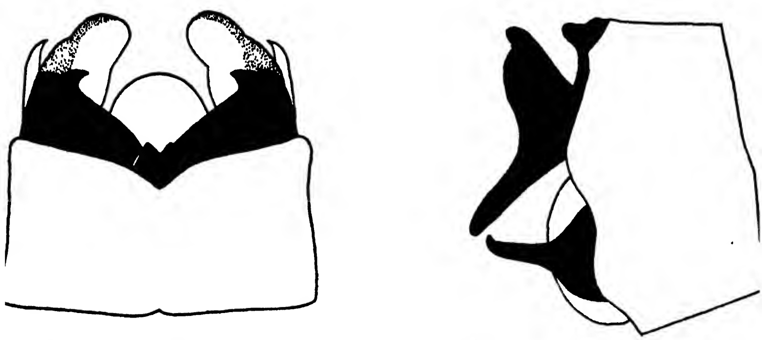
♂.—Pale blue with black as follows: a mid-basal dot on the labrum, a basal band connected with two spots laterally on the nasus, a short transverse isolated stripe a short distance ventral to the median ocellus, which the blue attains, and most of the vertex, leaving the following pale blue spots: two large post-ocular spots, a transverse bar along the posterior margin (not or barely connected with post-ocular spots), two small triangular spots between the median ocellus and the two lateral ones (in one male these two spots are connected with each other and with a small oblong spot between the two lateral ocelli), and two slightly larger triangular spots just external to the lateral ocelli. Second antennal segment black with a bluish spot on ventral surface.

A pair of curved black stripes, connected with a transverse band along posterior margin, on middle lobe of prothorax, an oblong spot dorsally on each lateral lobe. Mid-dorsal thoracic stripe divided into three narrow black stripes by two narrow pale blue areas; none of these three black stripes wider than one-sixth of the width of a mesepisternum.

Humeral stripe distinct above, ending in a fork on dorsal margin of mesinfraepisternum below, narrow and somewhat indistinct between and having adjacent to it a circular black spot on the anteroinferior angle of the mesepimeron. A short black line at upper end of each lateral thoracic suture.

Abdominal segments 1 to 7 black dorsally, except that the posterior margin of 1 is pale blue, the black on 2 is shaped like a spear-head pointing anteriorly, and there are interrupted pale blue basal bands on 3 to 7. Segments 8, 9 and 10 are all pale blue, except for very narrow transverse black lines at base of 8 and at base and apex of 10.

Superior appendages dark brown. Viewed from above, the upper branches are slightly divergent, the lower branches convergent. Upper branch short and stout, with large ante-apical tooth. Lower branch broad and blade-like, thickened externally and thin internally. Viewed



Dorsal and right lateral views of the male appendages of *Enallagma pallidum* n. sp. Camera lucida outlines.

in profile, upper and lower branches appear about equal in length, upper branch stout with a notch just below tip, lower branch slender. Inferior appendages slightly shorter than superiors, slender, almost straight, with a small hook at tip (see text-figures).

Wings hyaline, pterostigma brownish, light-bordered, surmounting less than one cell. Costal margin longest, proximal shortest, distal shorter than posterior. Arculus distal to second antecubital at a distance shorter than the length of the upper limb of the arculus, its limbs sub-equal. Upper side of quadrilateral about one-half of lower side in fore wings, more than one-half of lower side in hind wings. Inferior sector of triangle arises very slightly in front of submedian crossvein (at a distance shorter than the length of the crossvein itself) and ends at about the level of origin of the nodal sector. Superior sector of triangle ends between levels of origin of nodal and ultranodal sectors. Submedian crossvein between first and second antecubitals, nearer to second. fore wings with about nine postcubitals, hind wings with about eight.

The nodal sector arises nearest the fifth postcubital in fore wings (fourth in one wing out of four) and nearest the fourth in all hind wings. Ultranodal sector arises two cells proximal to the inner brace vein of the pterostigma in fore wings and one cell proximal in hind wings. Three antenodal cells in both wings.

Dimensions—abdomen 26 mm., hind wing 17 mm.

♀.—Pale greenish blue and black. Markings as in the male, except that the humeral stripe is ill-defined and reddish brown, there is a brown line on the entire length of the second lateral thoracic suture, and the anterior two-thirds of abdominal segment 8 has a wide dorsal stripe of black, fully four-fifths as wide as the segment in dorsal view. There is a narrow transverse basal brown stripe on 9, interrupted mid-dorsally, but no dark line at apex of 10.

Wings as in the male, but the pterostigma is decidedly paler and has the distal margin sub-equal to posterior.

Dimensions—abdomen 26 mm., hind wing 18 mm.

This species differs from *E. traviatum* by its three, narrow, mid-dorsal thoracic black stripes, by the male having the lower branch of the superior appendages sub-equal to the upper branch in profile view, abdominal segment 10 pale blue, etc.

From *E. antennatum,* whose male appendages are similar in profile view, it differs by having abdominal segments 8 to 10 almost entirely pale blue, by its narrower black thoracic stripes, etc.

One male and one pair in copula of this species were taken on July 26 at the large mill-pond of the Electric Light and Power Co. north of Salisbury, Maryland. The exact locality was a small cove, on the east side of the pond, just north of the railroad trestle which crosses it. At first sight, the slender form and pale blue color of the specimens reminded me of *Telagrion daeckii*, of which I had just taken a fine male at a neighboring pond. When I came to actually compare the two, however, the smaller size and the shape of the male appendages showed at once that they were distinct. Later, being unable to identify the specimens myself, I sent one of the males to Dr. P. P. Calvert, who informed me that it was a new species of *Enallagma,* most closely related, apparently, to *E. traviatum* Selys. I wish here to express my very great indebtedness to Dr. Calvert for his kindness in giving me this information.

I have requested Dr. Calvert to deposit the *type male* and *allotype female* of this species in the collection of the Philadelphia Academy of Natural Sciences. The other male is retained in my own collection.

# Corrections to the "Annotated List of the Diptera (Flies) of Oregon."

By F. R. Cole, Redlands, California.

The writer and Prof. A. L. Lovett published a list of the Diptera of the State of Oregon in the *Proceedings of the California Academy of Sciences,* volume XI, December 14, 1921. Since the publication of this list our attention has been called to several mistakes in the paper. We are indebted to Mr. S. B. Freeborn, Mr. C. W. Johnson, Dr. J. M. Aldrich and Dr. C. H. T. Townsend for suggestions and corrections. The numbers used in the original list are referred to here for convenience. There are a few typographical errors to be noted.

40.—*apernax* should be *spernax.*

46.—"at *clavipes*" should read "as *clavipes.*"

81.—*Anopheles occidentalis* D. & K. is the same as the European *maculipennis,* according to Edwards.

84.—The name *Theobaldia* is preoccupied and *Culiseta* should be substituted.

85.—*Culiseta consobrina* (Desv.) is synonymous with *Culex pipiens* L. and according to S. B. Freeborn, the species has been confused with *C. impatiens* (Walk.) and *C. inornatus* (Will.).

87.—*Culiseta inornata* (Will.) should be *inornatus.*

88.—The original description of *Culiseta sylvestris* (Theob.) was made under the genus *Culex,* later referred to *Aedes* and now considered synonymous with *Aedes vexans* Meig.

89.—According to Freeborn, *Culiseta stigmatosoma* (Dyar) belongs in the genus *Culex.*

234.—This species is not *costalis,* but is an undescribed form that will be considered in a revision of the Therevidae by the writer, now in press.

236.—This is not *notata,* an Atlantic coast species, but is a variety of the undescribed form mentioned above.

505.—*Syrphus americanus* is evidently preoccupied by the name used by Swederus in 1787 for a different Syrphid, possibly *Eristalis flavipes,* according to C. W. Johnson (see Can. Ent., Feb., 1919, p. 32). Mr. Johnson has proposed the name *wiedemanni* for the species generally known as *Syrphus americanus* Wied.

550.—*Eristalis meigenii* Wied. is a South American species, according to data furnished some years ago by Knab; our species is *Eristalis brousi* Will.

I am indebted to Dr. C. H. T. Townsend, now in Sao Paulo, Brazil, for a long list of corrections of names of the muscoid

flies in the Oregon List. Some of the suggestions and corrections may not be in accord with the views of other workers in the group, but they are nevertheless valuable and are greatly appreciated by the writer, whose knowledge of this difficult group is limited. Dr. Townsend has just completed a Manual of the Muscoid Flies of the World and believes that nothing but restricted genera will be found useful in the study of Muscoid forms and that they cannot be classified like other diptera.

620.—Probably *Bogeria fasciata* Swenk, according to Townsend, who states that *fasciata* Swenk, *fontinella* Clark and *emasculator* Fitch are all three distinct species.

621.—The holotype of *lepivora* Coq. is *Bogeria princeps* Aust., the allotype *Atrypoderma americana* Fitch.

623.—*Cistogaster immaculata* Macq., not *Gymnoclytia*.

625.—Townsend places *fuliginosa* R. D. in the genus *Rhodogyne*.

629.—Probably *Myiophasia oregonensis* Towns. and not *M. aenea* (Wied.).

631.—*Euadmontia pergandei* Coq., not *Hyperecteinia*.

632.—Townsend places *retiniae* Coq. in *Urophyllopsis*.

635.—The holotype is *Methypostena barbata* Coq., and according to Townsend, *Hypostena* is a synonym of *Dexia* Meigen, both having the same genotype, and is far removed from *Masicera*. Aldrich recently called the writer's attention to the fact that the species belonged to the European genus *Arrhinomyia*, but Townsend can see a distinction between the genera, although they are closely allied. *Torytachina*, *Odontosoma* and *Medina* are all closely related to *Arrhinomyia* and form a natural group.

636.—Townsend places *pristis* (Walk.) in *Anaporia*.

637.—The species is said by Townsend to be *Uromacquartia halisodotae* Towns., not *Oxydexia acuminata* Bigot!

638.—*Leskia gilensis* (Towns.) is placed in *Sipholeskia*.

639.—*Leucostoma atra* Towns. is placed in *Paradionaea*.

640.—Townsend places this form as *Galiathocera antennalis* Coq.

642.—*Clytiomyia atra* Coq. is placed in *Trichoclytia*.

643.—*Dionca nitoris* Coq. is placed in *Neodionaea*.

644.—There are several species of *Xanthomelana* in the west.

646.—*Heteropterina nasoni* Coq. is placed in *Nasonimyia*.

647.—Townsend states that the form called *Paraplagia spinulosa* (Big.) is probably *Euptilopareia erucicola* Coq.

648.—This is a species of *Voria*.

650.—Townsend thinks this species distinct from *trilineata*.

652.—*Ocyptera dosiades* Walker is placed in *Neocyptera*.

653.—*Panseria ampelus* Walker is placed in the genus *Ernestia* by Tothill (Can. Ent., Sept., 1921). Townsend considers *Ernestia* to be

tribally distinct and would place the species in *Varichaeta,* but it is doubtful if this genus is valid.

655.—*Gymnochaeta alcedo* Lw. is placed in *Chrysotachina.*

656.—*Exorista futilis* O. S. is placed in *Euexorista.*

657.—The form called *Exorista vulgaris* (Fall.) is placed by Townsend as *Phryxe hirsuta* O. S. or a new species.

658.—Perhaps *Neophorocera edwardsii* Will.

659.—Townsend says, "no telling what genus."

660.—Aldrich agrees with Townsend that *Phorocera saundersii* Will. should be placed in the genus *Madremyia.*

661.—*Frontina frenchii* (Will.) is placed in *Achaetoneura.*

662.—The form determined as *Tachina mella* Walk. is said by Townsend to be a species of *Exorista.*

663.—*Tachina robusta* (Towns.) is placed in *Tachinomyia.*

664.—The form determined by Aldrich as *Tachina rustica* Fall. is *Eribea spinulosa* Towns., according to Townsend.

665.—*Blepharipeza adusta* is placed in *Rileymyia.*

667.—Townsend thinks this is not *Winthemia quadripustulata* (Fabr.) but another species of the genus.

668.—*Metachaeta helymus* (Walk.) should be *M. atra* Coq.

669.—*Metopia leucocephala* (Rossi) should be *M. luggeri* Towns. The latter species is made a synonym of *leucocephala* in the Aldrich Catalogue.

670.—*Hilarella fulvicornis* (Coq.) is placed in *Euhilarella.*

671.—*Brachycoma sarcophagina* (Towns.) should be left in the genus *Laccoprosopa,* where it was described.

672, 673 and 674, according to Townsend, should not be called *Gonia,* but *Salmacia.*

675.—Townsend says of this form, "no telling what genus or species."

676.—*Cuphocera furcata* (v. d. W.) is placed as a species of *Sphyricera.*

677.—The form called *Peleteria robusta* (Wied.) is *Sphyromyia malleola* Bigot.

679.—Townsend's splitting of the genus *Echinomyia* is rather difficult to comprehend. *E. algens* (Wied.) is placed in his genus *Eularvaevora.*

680.—*Echinomyia dakotensis* is placed in *Larvaevoropsis.*

681.—*Echinomyia decisa* (Walk.) is placed in *Pararchytas.*

682.—*Echinomyia hystricosa* (Will.) is placed in *Protodejeania.*

683.—*Epalpus bicolor* (Will.) is placed in *Xanthoepalpus.*

684.—*Epalpus signiferus* (Walk.) is placed in *Argentoepalpus.*

685.—*Bombyliomyia abrupta* (Wied.) is placed in *Bombyliopsis.*

686.—The form called *Jurinella soror* (Will.) is a species of *Eublepharipeza,* according to Townsend.

687.—Townsend gives *Dinera futilis* Smith for this species, but this is a manuscript name, according to Aldrich, although used in literature a time or two.

688.—Townsend says this species is probably not *leucozona.*

690.—For the species given as *Trixa* (not *Trixia,* a misprint) *gillettei* Towns., Aldrich did not give any definite genus. Townsend has established the genus *Arctophyto* for the species. The species is correctly determined, as Aldrich has *gillettei* from the type locality and has examined the type.

Townsend has established many new genera among the ruins of the old genus *Sarcophaga.* To the writer's eyes many of the forms separated by Townsend are truly congeneric, but possibly the muscoid viewpoint will have to be attained first, as suggested by Townsend.

691.—Townsend puts *Sarcophaga aculeata* Aldr. in the genus *Acridiophaga.*

693.—*S. cimbicis* Towns. is placed in *Boettcheria.*

694.—*S. eleodis* Aldr. is placed in *Eleodiomyia.*

695.—*S. haemorrhoidalis* (Fall.) is placed in *Stephanostoma.*

696.—*S. helicis* Towns. is placed in *Helicobia.*

697.—*S. hunteri* Hough is placed in *Protodexia.*

698.—*S. kellyi* Aldr. is placed in *Kellymyia.*

699.—*S. pallinervis* Thoms. should be *Euravinia communis* Park.

700.—*S. planifrons* Aldr. is placed in *Miltoravinia.*

703.—*S. sinuata* Meig. is placed in *Sarcotachinella.*

705.—*Megerlea rufocaudata* Big. is placed in the genus *Tephromyiopsis.*

707.—*Cynomyia cadaverina* Desv. is placed in the genus *Cynomyopsis* and Townsend states that the form listed is more likely to be a western species of the genus.

708.—*Calliphora erythrocephala* is placed in the genus *Musca* by Townsend, but this change cannot be made if *domestica* is fixed as the type of *Musca.*

711.—There is some difference of opinion as to the placing of the three species, *regina* (Meigen), *terrae-novae* Desv. and *azurea* (Fall.). Rodhain and Bequaert put all of them in the genus *Phormia* and Aldrich is inclined to this view. Bezzi in a recent paper accepts *regina* as the genotype and considers the other species distinct from it. Townsend states that *azurea* is the genotype, putting *regina* in *Euphormia* and *terrae-novae* in *Protophormia.* So the matter rests largely on the correct designation of the genotype of the genus *Phormia.*

714.—Townsend places *cornicina* in *Orthellia.* The fact is now known that *cornicina* (Fabr.) has never been introduced from Europe and that our species is *caesarion* Meigen. This has been proven by examination of the European types.

716.—The species determined as *Mesembrina resplendens* Wahlberg is said by Townsend to be *Eumesembrina latreillei* R. D.

717.—Townsend places *Musca domestica* in *Promusca.* Most dipterists

will not accept this and it is understood that the International Commission on Zoological Nomenclature will vote to fix the type of *Musca* as *domestica*, as a *nomen conservandum*.

719.—*Lyperosia irritans* L. is probably preferable to *Haematobia serrata* Desv.

On page 317, figure 38, *fenestradis* should be *fenestralis*.

857.—According to C. W. Johnson, the species *Chaetopsis aenea* is misunderstood, the typical form being taken only from salt and brackish marshes of the Atlantic and Gulf Coast. The species taken in Oregon is probably *C. massyla* Walker, which Johnson has from Berkeley, California.

949.—*Leucopsis* is a misprint for *Leucopis*.

950.—This species is *avicularia* (L.).

## New North American Hesperiidae (Lepid.).

By A. W. Lindsey, Denison University, Granville, Ohio.

During the Fall of 1922 Mr. W. C. Dukes, of Mobile, Alabama, sent me a number of specimens of skippers which included a fine new species and an extremely dark form of *dion* which I believe to be worthy of a racial name. One specimen of the new species was also sent to Dr. Wm. Barnes, at Decatur, Illinois, and was placed as new by Mr. Benjamin before my specimens had reached me. In view of my interest in the family Hesperiidae and my possession of three other specimens, Dr. Barnes and Mr. Benjamin have generously yielded the authorship of the species to me.

**Atrytone (Euphyes) dukesi** n. sp.

♂. Wings more broadly rounded than in normal *Euphyes*, the secondaries conspicuously different, approaching the ♀ wing form of the genus.

Upper surface: Primaries lustrous brownish black with a black stigma of typical form which appears rather short through lack of contrast. Stigma followed by scattered fulvous scales which form vague patches between the veins. Base of primaries with some scales of the same color in the better specimens. Basal two-thirds of secondaries behind anterior margin of cell with fulvous hairs and scales, forming a rather definite patch between $M_1$ and $M_3$ beyond cell, and a triangular spot in the angle of $M_3$ and $Cu_1$, but otherwise diffuse. Fringe concolorous, slightly paler toward anal angle of secondaries. Body concolorous.

Under surface: primaries brownish black with the costa before SC yellow-fulvous, and a heavy powdering of scales of this color extending on through the costal area, over the apex, and back on the outer margin to $Cu_2$. Secondaries completely overlaid with this color, veins pale. Through the cell, fading toward the outer margin, is a pale ray,

and between $Cu_2$ and the first anal there is a similar pale stripe which is less definite. These marks are much the same as the pale stripes of *dion*. The entire ventral surface of the body is almost white, unlike the related species. The abdomen bears a dark brown midventral line. Expanse 35 to 38 mm.

Described from four males, all taken in Mobile County, Alabama, in 1922. *Holotype:* Aug. 6, in coll. Barnes. *Paratype:* Aug. 27, returned to Mr. Dukes. The two remaining *paratypes*, taken Aug. 27 and 29, are in the collection of the author.

In examining the genitalia of the holotype *in situ*, I was inclined to agree with Mr. Benjamin that the valve differed in shape from that of *dion*. Subsequently I dissected out and mounted the genitalia of one of the paratypes, which prove to be indistinguishable from those of a specimen of *dion* from Wisconsin. The species is, however, very distinct from any other in the North American fauna. Its salient features are the extremely dark color and the abnormal wing shape. Mr. Benjamin compared the holotype with material in the National Museum, and has given me Mr. Schaus' note that it is nearest to *Hesperia aurina* Plötz from Jamaica, although undoubtedly distinct. It gives me great pleasure to name this species for Mr. Dukes, in acknowledgment of his unselfish efforts to advance our knowledge of the Lepidoptera of Alabama.

**Atrytone (Euphyes) dion** race **alabamae** new.

♂. Similar to *dion*, but with the yellow-fulvous of the upper surface reduced to a single subapical spot between $R_5$ and $M_1$, a streak in the lower angle of the cell, and a small dot beyond this which is the first of a series forming a greatly reduced band along the outer edge of the stigma. This leaves a fuscous terminal area occupying about two-fifths of the length of the wing. Secondaries also with the fulvous reduced, though less conspicuously.

Under surface darker than in *dion*. The macular band of the primaries is limited to three small spots beyond the stigma, and the two pale rays on the secondaries are less in contrast with the ground color than in *dion*.

*Holotype:* 1 ♂, Mobile County, Alabama, June 25, 1922, W. C. Dukes, in the collection of the author.

The records of distribution of *dion* available to me show New Jersey as the southernmost reported capture, and all specimens which I have seen are so much paler and brighter than *alabamae* that they might easily be taken for a different species. The primaries of the race are rather like those of *bimacula*.

Mr. Dukes has also sent me one male of *Poanes viator* taken at Chikasaw, Alabama, Oct. 1, 1922. This appears to be a new southern record also.

# Notes on Pennsylvania Diptera.

By A. B. CHAMPLAIN and J. N. KNULL, Bureau of Plant Industry, Harrisburg, Pa.*

Among the Dipterous material in the state collection of the Pennsylvania Bureau of Plant Industry are certain species or specimens that bring to mind some new or interesting facts of a biological nature, worthy of record.

The following notes are from captures and observations made by the authors, who have given special attention to bringing together and collecting biological data on local insects, and by other members of the Bureau, who have been credited with their notes in each instance.

The authors are indebted to Mr. Chas. W. Johnson, of the Boston Society of Natural History, for identifications and suggestions.

TIPULIDAE.—*Tanyptera* [*Xiphura*] *frontalis* O. S., *T. fumipennis* O. S., *T. topazina* O. S.

Adults of the three species were collected in flight, from May 25th until June 10th, in a swampy bottom, northern exposure, at Inglenook, Pennsylvania. Larvae of *Tanyptera* may be found in this swamp throughout the year in galleries in watersoaked or moist brashy stumps, logs, and limbs of trees on the ground.

MYCETOPHILIDAE.—*Diomonus subcaeruleus* Coq. An adult of this rare fly was captured flying at Inglenook, Pa., June 17.

TABANIDAE.—*Haematopota rara* Johnson. Represented by two specimens, both collected by Prof. J. G. Sanders at Montebello, Pa., June 24, 1917, and at Hummelstown, Pa., June 10, 1920, respectively, while sweeping sedges along the edge of small streams.

LEPTIDAE.—*Xylophagus abdominalis* Loew.

Adults were reared from larvae collected beneath the bark of dead pine, where they were observed feeding on the larvae of the beetle, *Rhagium lineatum* Oliv.

CYRTIDAE.—*Oncodes dispar* Macq.

While chopping into an old decaying log in Wildwood Park, Harrisburg, Pa., August 20th, some years ago, adults of this Cyrtid were found dead, but in good condition, in the cells of a

* Publication suggested by Prof. J. G. Sanders, Director of the Pennsylvania Bureau of Plant Industry.

spider-killing wasp. The wasp apparently caught the spiders that were infested by larvae of *Oncodes,* stored them in cells with her eggs, sealed the gallery and departed. The *Oncodes* larvae consumed the spiders and possibly the wasp larvae, then transformed and were unable to get out. Remains of the spiders were present in the cells.

*Opsebius pterodontinus* O. S., Manada Gap, Dauphin Co., Pa., July 4, 1920,—a living adult found floating in a small spring at the foot of the mountain.

MYDAIDAE.—*Mydas tibialis* Wied. A single example of this species, labeled Perdix, Pa., July 19, 1914, is in the Bureau collection. It was collected by Mr. J. E. MacNeal, who presented it to the late V. A. E. Daecke.

ASILIDAE.—*Dasyllis grossa* Fabr.

An adult of this large fly was observed capturing a specimen of *Tibicen sayi* S. & G. in midair, at Montebello, Pa. The cicada was probably twenty feet from the ground when it suddenly dropped to earth with the *Dasyllis.* In this case the prey was too bulky to carry off, as is the usual practice.

*Nusa fulvicauda* Say, Hummelstown, Pa., June 1.

Larvae and pupae of this species found in the pupal cells of *Chrysobothris femorata* Oliv. in *Quercus* sp. were caged and reared.

EMPIDAE.—*Rhamphomyia* sp.

"On April 12th, 1921, I noted the mating of flies of this genus. My attention was attracted to what seemed to be small clusters of dead flies on the roots of some uprooted peach trees in Miller's orchard at Marion, Pa. Each cluster proved to be a male and female in copulation. The male hung suspended by the hind legs from a support and held the female with his middle and front legs. The female in turn held a smaller fly with her legs and appeared to be feeding upon it. In collecting three pairs of flies, I obtained three different species of flies in the grasp of the females. Two of these flies were dead and one alive."—J. R. STEAR.

PHORIDAE.—*Aphiochaeta?* sp.

Violet seeds collected for the seed herbarium by Mr. W. A. McCubbin were found to be infested by specimens of a small

maggot that had eaten out the interior of the seed. The seeds had been collected at Edenville, Pa., May 24th, and were not examined until August 28, 1922, when the damage was noticed. At this time there were a number of dead, dried larvae in the vials (probably on account of lack of moisture) and about six pupae, which were also dead. These pupae, however, were identical with the drawing and description of *Aphiochaeta rufipes* Meig., a species that was recorded as infesting onion seed,[1] by Mr. B. H. Walden in Connecticut.

It is likely that the seed became infested when on the drying trays.

SYRPHIDAE.—*Microdon craigheadi* Walton.

This beautiful little green species occurs at Rockville, Pa., July 23 to August 4th. It may easily be mistaken for a "Cuckoo wasp," *Chrysis* sp., as it has the habit of flying up and down in a nervous manner, along the trunks of dead trees (*Pinus*) like the *Chrysididae*. It seemed to be especially interested in the dead snags infested by ants and probably breeds in these stumps. It is rare and difficult to catch.

*Meropioidus villosus* Bigot. One specimen of this species captured on the mountain top at Rockville, Pa., 1200 feet elevation, March 30, on open catkin of Alder, (*Alnus* sp.)

*Volucella vesiculosa* Fabr. The larvae may be found breeding in wounds and pockets in oak trees, the adults feed on running and fermenting sap on oak trees. The records in the collection are as follows:—Charter Oak, Pa., July 11, two males, Knull. Cresco, Pa., June 10, one male, H. B. Kirk. Harrisburg, Pa., July 20, at fermenting sap, four females, H. B. Kirk; Manumuskin, N. J., June 23, male, V. A. E. Daecke; Da Costa, N. J., June 4, Daecke.

*Criorhina nigriventris* Walton.

The type of this species[2], a female, was taken in Wildwood Park, Harrisburg, Pa., March 24, resting on a tree trunk, in a swampy region, near the foot of the first mountain and no additional specimens were taken for several years. The apparent center of distribution was finally located. On the extreme top of the first mountain (Rockville, Pa.), three miles from where

[1] Rep. Conn. Agriculture Experiment Station 1909-10, 693.

[2] W. R. Walton, Ent. News, XXII, p. 318, 1911.

the type was taken, there is a rocky ridge where the boulders are piled by nature in picturesque confusion; cropping out here and there in addition to other vegetation grows a wild gooseberry, *Ribes rotundifolium?* From April 20th until May 15th, or thereabouts, the adults of *Criorhina nigriventris* are to be found, flying about in the air, resting on the boulders in the sunny spots and visiting the gooseberry blossoms, which appear to furnish their favorite food.

In company with *C. nigriventris,* which is not rare, but exceedingly wary and swift in flight, and difficult to capture, we find *Criorhina verbosa* Walk. very common, and also feeding in the gooseberry flowers.

Our captures of *C. nigriventris* are not very numerous; a visit to "Criorhina Hump," as we now call it, at the proper time each year, will furnish sport, exercise, and the possibility of a specimen or two of this interesting fly.

TACHINIDAE.—*Schizotachina vitinervis* Thomp., Hummelstown, Pa., 1922.

Reared from Yellow Pine needles infested with needle-mining Lepidopterous larvae, probably *Paralechia pinifoliella* Cham.

*Pachyophthalmus signatus* Meig., Linglestown, Pa. Reared from cocoon of *Trypoxylon albitarse* Fab.

*Euthera tentatrix* Loew, Charter Oak, June 20; Chambersburg, June; Cresco, July; Hunters Run, Pa., May 30.

DEXIIDAE.—*Eutheresia canescens* Walk. This species is a parasite of *Rhagium lineatum* Oliv. Adults were reared in June from *Rhagium* larvae, collected beneath white pine bark at Charter Oak, Pa.

SAPROMYZIDAE.—*Lonchaea polita* Say.

"Wildwood Park, Harrisburg, Pa., February 12, in swamp. Quite a number of larvae found scattered between the thin, moist, frosty, ribbon-like inner layers of bark on a dead black locust log.

"Some of the larvae, separated for observation, are quite active and are capable of climbing up the vertical side of a vial. They also 'skip' vigorously. They have a pair of small, black, curved hooks which they 'thrust from the mouth' or hook to the anal end when 'skipping.'

"The larvae went into the sand in the cages to pupate, some

at the bottom of the cage, others scattered through the sand, but all beneath the surface.

"There was a species of *Trypetid* among the flies that emerged but the majority were *Sapromyzidae*."—A. F. SATTERTHWAIT.

Harrisburg, Pa., May 14, Larvae and pupae from beneath loose bark of dead white pine stub. Adults emerged May 19. —H. B. KIRK.

ORTALIDAE.—*Pyrgota chagnoni* Johnson. One specimen collected at Wilkes-Barre, Pa., May 27.

TRYPETIDAE.—*Rhagoletis pomonella* Walsh.

"From infested apples caged near New Bloomfield, Perry County, Pennsylvania, the first fly emerged on June 27, and the first fly of the second brood emerged on August 31. The last fly of the second brood emerged on October 12. Flies were observed in the orchard from June 27 until frost."—T. L. GUYTON and J. N. KNULL.

MICROPEZIDAE.—*Taeniaptera* [*Calobata*] *antennipes* Say. Eberleys Mills, Pa., July 11 to 14, on trees in a small, triangular bottom along the Yellow Breeches Creek.—Kirk and Champlain.

HIPPOBOSCIDAE.—*Ornithoica confluenta* (Say), Wellsboro, Pa., Nov. 21, from Barred Owl.

**Change of Address.**

Mr. Hermann Hornig has removed his residence to 1233 North 44th St., Philadelphia, Pa.

**A Bird Catching a Butterfly (Lepid.: Pieridae).**

On April 29, 1923, I went to Almonessen, New Jersey, to have a collecting trip for *Anthocharis* and *Thecla.*

Insects were very few: 3 *Anthocharis genutia*, 2 *Pieris rapae*, 2 *Thecla hypophleas*, 1 *Th. comyntas*, 2 *Th. damon* and a few Crane-flies. I caught 2 genutias. The third one, a female, was flying at the edge of the woods near briars. I watched for it to come into the open. Unexpectedly a bird swooped down, caught the genutia and settled on a branch overhead about 12 feet away from the place I was standing. The bird, a red eyed Vireo, shifted the genutia lengthwise in his beak and swallowed it entirely.

You may know how surprised I was, as I never in all the past years saw a bird catching a butterfly. (I saw them picking moths). I thought the bird would drop the butterfly's wings so I could examine and take them as proof, but there was nothing left.—H. HORNIG, City Entomologist, Room 758, City Hall, Philadelphia, Pa.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JULY, 1923.


## The Zoological Record.

In the NEWS for March, 1922, page 91, under the caption "Save the Zoological Record!" we reprinted from *Science* an appeal issued by Mr. W. L. Sclater, Editor of the Record, for the Zoological Society of London, urging fuller support for the *Record* from working zoologists everywhere. In our editorial for April, 1922, pages 119-120, we strongly seconded this appeal.

*Science* for May 18, 1923, page 577, reprints a letter by Mr. P. Chalmers Mitchell to the London *Times* in which the following occurs:

May I say that the council of the Zoological Society will much regret if the *Zoological Record*, which it has supported with increasing financial difficulty for many years, has to be dropped? But the annual loss on the issues is over £1,100, and is likely to increase as the output of zoological research increases. . . . Last year the council, in its annual report and in circulars addressed to zoologists and zoological institutions throughout the world, explained the financial position, and stated that unless those to whom the *Record* was "invaluable" showed their appreciation of it by subscribing for a sufficient number of copies, the society could no longer undertake the publication. The response was unsatisfactory, and the council has accordingly taken the inevitable step of making it known that the *Record* will be discontinued unless substantial help is forthcoming. But it is so anxious to give those to whom the *Record* is necessary full opportunity of coming to its support, that it has undertaken to proceed with the compilation so that no time may be lost. . . . Because of the drain of the *Record* on our resources we have already been compelled to suspend the publication of our "Transactions," and to postpone other scientific work of immediate interest to us; we are certainly not going to suspend the issue of our "Scientific Proceedings," which have appeared continuously since 1829, in order to carry out bibliographical work for other institutions. On the other hand, we are ready to continue the *Record*, and to regard a loss of £500 a year as part of our contribution to the common good of zoological science, if other institutions guarantee us against further loss.

We do not know to what extent entomologists have responded to the Zoological Society's appeal of 1922. In the

event that this editorial may meet the eyes of some who can help with the *Record,* but have not done so, we put the question to them: Do you realize what the discontinuance of the *Record* will mean to you? Do you realize that unless the Concilium Bibliographicum speedily brings up its bibliographical data (now back in 1917) to the present, supposing also that the *Concilium* is satisfactory to you, you will be compelled to gather your own zoological bibliography at a great expense of time and with probably much less completeness than the *Record* has afforded? Are you willing to see this deplorable state of affairs come about? If not, will you not exert yourself immediately to obtain additional subscriptions for the *Record* and forward them to the Zoological Society of London? The subscription price for the entire volume per annum is £2 10s (single volumes £3), but separate divisions of the volumes may be subscribed for, *e. g.,* the Insecta at 15 shillings, the Trilobita, Arachnida and Myriopoda, at 4 shillings for the three groups combined.

We urge this upon zoologists and entomologists even if the institutions with which they are connected are already subscribers to the *Record.* The writer is not asking others to do what he has not done himself a year ago in response to the appeal then issued, even though a large part of each volume will be of no use to him. Better still, let all institutions who can offer to guarantee to the support of the *Record* a certain annual sum, say fifty or one hundred dollars each. No great number of guarantors throughout the world would be required to cover all expenses.*

We may again voice the hope expressed in our editorial of April, 1922, that co-operation between the *Zoological Record* and the *Concilium Bibliographicum* may be arranged, but, pending that consummation, the *Record* should be kept going and, as usual, the necessity is financial support.

---

* Since the above was written the Council and the Library Committee of the Academy of Natural Sciences of Philadelphia have voted to offer to the Zoological Society of London a guarantee of $100. toward the expenses of the volume of the *Record* issued during the year ending July 1, 1924, and to address other institutions, urging them to take similar action.

# Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### Correction of Several Typographical Errors (Phalaenidae = Noctuidae, Lepid).

Attention is called to a paper by Professor Grote, "Introduction to a Study of the North American Noctuidæ," published 1883, Proc. Am. Phil. Soc., XXI. Page 159 calls attention to a number of typographical errors most of which have been perpetuated to date. These names are quoted herein; each name being followed by the name of the genus now commonly employed and the Barnes and McDunnough 1917 Check List number, in order to facilitate correction. The name before the *as* is intended by Grote as the correction for the name which follows: "Phiprosopus Callitrichoides *as* Phyprosopus Callitrichoides," *Phiprosopus,* No. 3436.

"Phisia Viridisignata *as* Plusia Viridisigma," *Autographa,* No. 3234 syn.

"Perigea Sole *as* Perigea Scole," *Perigea,* No. 2322a.

"Hadena Perpensa *as* Hadena Perpenoa," *Trachea,* No. 2289.

"Oncocnemis Gracillima *as* Oncocnemis Gracillinea," *Oxycnemis,* No. 2541.

"Heliochilus Paradoxus *as* Heliocheilus Paradoxus," *Heliothis,* No. 1087.

Strangely, in these corrections there are three more typographical errors; *Phisia* for *Plusia, Sole* and *Scole* for *Iole* and *Icole.* The correct spelling of the name of the *Perigea* is shown on page 146 of the same paper, "Perigea Iole *m.,*" and the *Perigea icole* of the lists should be amended to read *Perigea iole.*—WM. BARNES and F. H. BENJAMIN, Decatur, Illinois.

---

### On Megathymus stephensi Skinner (Lepid., Hesperiidae).

*Megathymus stephensi* Skinner

1905, Wright, Butt. W. Coast, p. 255, pl. XXXII, f. 483, as *neumoegeni* in err., *Megathymus.*

1912, Skinner, Ent. News, XXIII, 126, *neumoegeni* ssp., *Megathymus.*

1912, B. & McD., Contr. Nat. Hist. Lep. N. A., I, (5), 44, *neumoegeni* race, *Megathymus.*

1913, B. & McD., Contr. Nat. Hist. Lep. N. A., II. (1), 4, pl. I, f. 7, *neumoegeni* ——, *Megathymus.*

1917, Skinner, Ent. News. XXVIII, 232, an sp. dist., *Megathymus.*

1921, Lindsey, U. of Ia. Studies, IX, (4),=Hesp. Amer., p. 109, *neumoegeni* race, *Megathymus.*

Having examined the genitalia of the various species of Megathymus of the *neumoegeni* group, the authors are quite willing to agree with Dr. Skinner's latest version of the status of *stephensi*. It is apparently a distinct species; the valves of the male genitalia differing considerably in shape from other members of the *neumoegeni* group.

WM. BARNES AND F. H. BENJAMIN, Decatur, Illinois.

---

**External Parasites of the Prairie Mole Scalops aquaticus (Linn.) (Siphonap., Anopl.).**

What appears to be a new host record was the finding of a flea, *Ctenophthalmus genalis* Baker, (fide Ferris) by the writer on moles caught in the vicinity of Ames, Iowa, during November, 1922, and April, 1923. This flea was taken on several different moles but it never occurred in large numbers. The type specimens of this parasite, which furnish the only published record of its capture, were taken in Michigan without identification of host.

A louse, *Euhaematopinus abnormis* Osborn, was also found and was very abundant. It was originally recorded from Ames, and seems to be a species that is peculiar to this particular species of mole. As a result of very heavy infestation on one side of an animal the fur was very short, giving it the effect of a rather close clipping; the fur and skin on the uninfested side of this mole were normal.—E. W. DUNNAM, Dept. Zoology and Entomology, Iowa State College, Ames, Iowa.

---

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **12**—Journal of Economic Entomology, Concord, N. H. **16**—The Lepidopterist, Salem, Mass. **19**—Bulletin of the Brooklyn Entomological Society. **20**—Bulletin de la Societe Entomologique de France, Paris. **22**—Bulletin of Entomological Re-

search, London. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **50**—Proceedings of the United States National Museum. **51**—Archiv fur Mikroskopische Anatomie, Bonn. **52**—Zoologischer Anzeiger, Leipzig. **54**—Proceedings of the Biological Society of Washington, D. C. **57**—Biologisches Zentralblatt, Leipzig. **64**—Parasitology, London. **67**—Le Naturaliste Canadien, Quebec. **68**—Science, Garrison-on-the-Hudson, N. Y. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **76**—Nature, London. **90**—The American Naturalist, Lancaster, Pa. **91**—The Scientific Monthly, Lancaster, Pa. **94**—The American Journal of Science, New Haven, Conn. **98**—Annals of Tropical Medicine and Parasitology, Liverpool. **99**—Bulletin du Museum National d'Histoire Naturelle, Paris. **115**—Societas Entomologica, Stuttgart. **124**—Bulletin de la Societe entomologique d'Egypte, Cairo. **125**—Verhandlungen der zoologisch-botanischen Gesellschaft in Wien. **128**—Zeitschrift fur Induktive Abstammungs und Vererbungslehre, Leipzig. **138**—American Museum Novitates, New York. **145**—Annali del Museo Civico di Storia Naturale Giacomo Doria, Genova. **146**—"Konowia," Wien.

**GENERAL.** **Ball, E. D.**—Courses for the post-graduate student of entomology. **12,** xvi, 182-5. **Banks, C. S.**—A method of illustrating insect wings. (Phil. Jour. Sci., xxii, 407-12.) **Bather, W. T.**—Another reminiscence of early days. **19,** xviii, 56-7. **Bibliographia** zoologica. Vol. xxxi. **Brues, C. T.**—Is poliomyelitis an insect-borne disease? **91,** xvi, 471-87. **Buddenbrock, W. V.**—Einige bemerkungen ueber den schwirrflug der insecten mit besonderer berucksichtigung der halteren der zweiflugler. (Verh. Heidelb. Natur. Med. Ver., n. f., xiii, 497-15.) **Chapman, T. A.**—What is a species? **21,** xxxv, 62-4. **Chappellier, A.**—Regime alimentaire des corbeaux freux et "moyens de defense" des insectes. **20,** 1923, 73-5. **Cockerell, T. D. A.**—The data of entomology. **4,** lv, 79-80. Insects and other arthropods of the Green River formation. (U. S. Geol. Surv., Bull. 729, 23-30.) **Craighead, F. C.**—The host selection principle as advanced by Walsh. **4,** lv, 76-9. **Dicksee, Uvarov & Burr.**—The distress of Russian entomologists. **9,** lvi, 99. **21,** xxxv, 65-6. **Escherich, K.**—Zeitschrift fur angewandte entomologie. viii, Heft 2. **Felt, E. P.**—Origin and evolution of the insects. **91,** xvi, 588-93. **Handlirsch, A.**—Revision der Palaozoischen insekten. (Denkschr. Math.-Naturw. Klasse, Acad. Wissens. Wien. cxvi, 511-92.) **Hargitt, G. T.**—Invertebrate animals and civilization. **91,** xvi, 608-22. **Hoffman, A.**—Marktbericht. **124,** iii, 45-6. **Hunt, H. F.**—Preservation of specimens: mould. **9,** lvi, 115-6. **Kellogg, V.**—Extra-entomological studies for the young entomologist. **12,** xvi, 185-97. **Locket, G. H.**—Tactile vision of insects and arachnida. **76,** cxi, 570-71. **Mitchell, P. C.**—The "Zoological Record." **68,** lvii, 577. **Moore, W.**—The need of chemistry for the student of entomology. **12,** xvi, 172-6. **O'Kane,**

**W. C.**—The entomologist and the public. **12**, xvi, 176-82. **Pierce, W. D.**—The laws of nature as affecting insect abundance. (Lectures in Ap. Ent., Ser. 1, pt. 2, No. 0.)

**ANATOMY, PHYSIOLOGY, ETC.** **Breitenbecher, J. K.**—A red-spotted sex-limited mutation in Bruchus. **90**, lvii, 59-65. **Cannon, H. G.**—Spermatogensis of the Lepidoptera. **76**, cxi, 670-71. **Clausen, R. E.**—Inheritance in Drosophila hydei. **90**, lvii, 52-8. **Gatenby, J. B.**—Spermatogenesis of the Lepidoptera. **76**, cxi, 568. **Loewenthal, H.**—Cytologische untersuchungen an normalen und experimentell beeinflussten Dipteren (Calliphora erythrocephala). (Archiv f. Zellforschung, Leipzig, xvii, 86-101.) **Mann, M. C.**—The occurrence and hereditary behavior of two new dominant mutations in an inbred strain of Drosophila melanogaster. Genetics, viii, 27-36.)

**ARACHNIDA AND MYRIOPODA.** **Schrader, F.**—Haploidie bei einer spinnmilbe. **51**, xcvii, 610-21.

**THE SMALLER ORDERS OF INSECTA.** **Barber, B. A.**—Notes on the life-history and habits of Mallophaga. (Pap., Mich. Ac. Sc. A. & Let., i, 391-5.) **Enderlein, G.**—Beitrage zur kenntnis der Copeognathen VII. **146**, ii, 32.3. **Esben-Petersen, P.**—Ueber das genus Dendroleon. **146**, ii, 86-92. **Philiptschenko, J.**—Studien ueber variabilitat. 3. Ueber die variabilitat der Collembolen. **128**, xxx, 145-62. **Smith, R. C.**—The biology of the Chrysopidae. (Cornell Agr. Expt. Sta., Mem. 58.) **Snyder, T. E.**—A new Glyptotermes from Porto Rico. **10**, xxv, 89-94. **Suminski, S.**—Sur la structure et la developpement des organes copulateurs males chez l'Anax imperator. [Polish]. (Trav. Soc. Sci. Varsovie, Cl. Sci., 1917, No. 22.)

**Cockerell, T. D. A.**—Fossil insects from the Eocene of Texas. **94**, v, 397-400. **Williamson, E. B.**—A new sp. of Williamsonia. (Odonata.) **4**, lv, 96-8.

**ORTHOPTERA.** **Caudell, A. N.**—Correction in Zoraptera. **10**, xxv, 104. **Chopard, L.**—Description d'un Gryllide cavernicole de la Jamaique. **20**, 1923, 84-6. **Schaxel & Adensamer.**—Ueber experimentelle verhinderung der regeneration bei Phasmiden. **52**, lvi, 128-33. **Vignon, P.**—Sur le mimetisme des sauterelles Pterochrozees. **69**, 1923, 1348-50. **Vignon, P.**—Notes sur les Pterochrozae du Mus. Nat., Paris. Sept especes nouvelles dans le genre Pterochroza. **99**, 1922, 523-29.

**HEMIPTERA.** **Barber, H. G.**—A preliminary report on the Hemiptera-Heteroptera of Porto Rico collected by the American Museum of Nat. Hist. **138**, No. 75. **Chapais, J. C.**—Comment se debarrasser des mouches blanches de nos serres chaudes. **67**, xlix, 219-22. **Ferris & Hyatt**—The life history of Euphyllura arbuti. (Chermidae.) **4**, lv, 88-92. **Hartzell, A.**—Distribution of the Euro-

pean elm scale. (Proc. Iowa Acad. Sc., xxviii, 201-5.) **McAtee & Malloch**—Further notes on names of Emesinae and other Rhynchota. **54**, xxxvi, 161-4. **Parshley, H. M.**—The distribution and forms of Lygaeus kalmii, with remarks on insect zoogeography. (Lygaeidae.) **4**, lv, 81-4. **Schmidt, E.**—Neue Fulgoriden. **115**, **xxxviii, 17-18.** **Schrader, F.**—The sex ratio and oogenesis of Pseudococcus citri. **128**, xxx, 163-82. **Stear, J. R.**—Orthocephalus mutabilis. (Miridae.) **19**, xviii, 62. **Takahashi, R.**—Observations on the Ochteridae. **19**, xviii, 67-8.

**LEPIDOPTERA.** **Blackmore, E. H.**—Rare and uncommon lepidoptera taken in Br. Columbia during 1922. (Rept. Br. Col. Prov. Mus. N. H., 1922, O, 23-35.) **Clark, B. P.**—Thirty-three new Sphingidae. (Proc. N. Engl. Zool. Club, viii, 47-77.) **Cleare, L. D.**—Notes on the small moth-borers of sugar-cane in Br. Guiana. **22**, xiii, 457-68. **Meyrick, E.**—Exotic Microlepidoptera. ii, 609-40. **Pruffer, J.**—Forschungen uber die abhangigkeit der schmetterlingsflugel von der gestalt der schuppen. (Comp. Rendus Sean. Soc. Sci. Varsovie, ix, 1916, 1139-54.) **Pruffer, J.**—Neue formen von schmetterlingen Perus. (Disc. Biol. Arch. Soc. Sci. Versav., i, Fasc. 2.) **Seitz, A.**—The macrolepidoptera of the World. Fauna Amer. pts. 120-123. Arctiinae, Phaegopterinae.

**Barnes & Benjamin**—Notes and new species (Geometridae.) **16**, iv, 9-12. **Blackmore, E. H.**—Two new races of the genus Plebeius from Br. Columbia. **4**, lv, 98-100. **Cassino & Swett**—New Geometrids. **16**, iv, 13-16. **Heinrich, C.**—Revision of the N. American moths of the subfamily Eucosminae of the family Olethreutidae. (U. S. Nat. Mus., Bull. 123.)

**DIPTERA.** **Buddenbrock, W. V.**—(See under General Subjects.)

**Brunetti, E.**—Two n. species of Tabanidae from Cuba. **22**, xiii, 401-2. **Christophers, S. R.**—An Anopheles of the Myzorhynchus group (Anopheles amazonicus) from S. America. **98**, xvii, 71-8. **Cuenot & Mercier**—Les muscles du vol chez mutants alares des Drosophiles. **69**, 1923, 1112-12. **Edwards, F. W.**—New and old observations on Ceratopogonine midges attacking other insects. **98**, xvii, 19-29. **Evans, A. M.**—Notes on Culicidae in Venezuela, with descriptions of n. sps. **98**, xvii, 101-11. **Ferris, G. F.**—Observations on the larvae of some Diptera Pupipara, with description of a new sp. of Hippoboscidae. **64**, xv, 54.8. **Greene, C. T.**—A contribution to the biology of N. A. diptera. **10**, xxv, 82-9. **McAtee, W. L.**—District of Columbia diptera: Bibionidae. **10**, xxv, 81-2. **Marchand, W.**—The larval stages of Limnophora discreta. (Anthomyiidae.) **19**, xviii, 58-62. **Shannon, R. C.**—Rearing dipterous larvae on nutrient agar. **10**, xxv, 103-4. **Smirnov, E.**—Ein beitrag zur kenntnis der gattung Helophilus. **52**, lvi, 81-87.

**Aldrich, J. M.**—A new parasitic fly bred from the bean-weevil. **10,** xxv, 95-6. **Cole, F. R.**—A revision of the North American two-winged flies of the family Therevidae. **50,** lxii, Art. 4. **Curran, C. H.**—Revision of the asilid genus Cyrtopogon and allied genera. **4,** lv, 92-5. **Sturtevant, A. H.**—New species and notes on synonymy and distribution of Muscidae Acalyptratae. **138,** No. 76.

**COLEOPTERA. Andrews, A. W.**—The coleoptera of the Shiras expedition to Whitefish Point, Chippewa Co., Michigan. (Pap., Mich. Ac. Sc. A. & Let., i, 293-390.) **Benderitter, E.**—Quelques Rutelides exotiques nouveaux. **20,** 1923, 91-4. **Bernhauer, M.**—Neue Staphyliniden aus Sudamerika. **125,** lxxxi, 1-23. **Blanchard, F. N.**—The tiger beetles of Cheboygan and Emmet Co., Michigan. (Pap., Mich. Ac. Sc. A. & Let., i, 396-417.) **Pic. M.**—Melanges exotico-entomologiques. Fasc. 38. **Pic, M.**—Scaphidiides nouveaux de diverses origines. **145,** xlix, 93-7. **Szwajsowna, P.**—Le metabolisme physiologique chez les larves du Tenebrio molitor. Polish. (Comp. Rendus Sean. Soc. Sci. Varsovie, ix, 1916, 405-27.) **Woods, W. C.**—Altica or Haltica? **19,** xviii, 63-7.

**Van Dyke, E. C.**—New species of C. from California. **19,** xviii, 37-53.

**HYMENOPTERA. Brocher, F.**—La tete du frelon (Vespa crabro). (Bul. Inst. Nat. Genevois, xlv, 223-56.) **Forel, A.**—Le monde social des fourmis Tome. 4, Alliances et guerres, parabiose, lestobiose, esclavagisme, 170 pp. **Friese, H.**—Ein instruktives bienennest aus den hochanden Chiles. **45,** xviii, 56-7. **Friese, H.**—Ueber einige neue Euglossa-arten. **146,** ii, 24-8. **Kohl, F. F.**—Die Hymenopteren-gattung Belomicrus. **146,** ii, 98-122 (cont.) **Masi, L.**—Spolia Hymenopterologica. **145,** xlix, 235-41. **Rohwer, S. A.**—National collection of Cynipidae. **10,** xxv, 106. **Santschi, F.**—Myrmicines, dolichoderines et autres formicides neotropiques. (Bul. Soc. Vaud. Sci. Nat., Lausanne, liv, 345-78.) **Stockhert, E.**—Ueber entwicklung und lebensweise der bienengattung Halictus, und ihrer schmarotzer. **146,** ii, 48-64. **Thompson, W. R.**—Sur le determinisme de l'apterisme chez un Ichneumonide parasite. **20,** 1923, 40-2. **Wasmann, E.**—Alte berichte ueber die Atta-nester Sudamerikas, mit einem statischen vergleich der anpassungen an Atta und an Eciton. **57,** xliii, 106-15. **Waterson, J.**—On an internal parasite of a thrips from Trinidad. **22,** xiii, 453-55.

**Cockerell, T. D. A.**—Two nocturnal bees and a minute Perdita. **138,** No. 66. **Cockerell, T. D. A.**—(See under Smaller Orders.) **McDunnough, J.**—Notes on Pterophoridae with descriptions of n. sps. **4,** lv, 85-7. **MacGillivray, A. D.**—New species of Tenthredinidae from the East and Middle-west. **19,** xviii, 53-6. **Rohwer, S. A.**—New Aculeate Hymenoptera from the U. S. **10, xxv, 96-103.**

# Doings of Societies.

## The American Entomological Society.

Meeting of April 26, 1923, in the hall of the Academy of Natural Sciences of Philadelphia, Dr. Henry Skinner, President, in the Chair; seven members present.

Mr. Cresson of the Property Committee reported the receipt of insects for the collection from the following: 7 Diptera from T. D. A. Cockerell; 1 Diptera, 4 Neuroptera and 2 Orthoptera from M. Hebard; 1 Orthopter from F. M. Jones; 268 insects, 210 galls (Paratypes) from A. C. Kinsey; 22 Mayflies from G. S. Dodds; 4 Cicadidae from W. T. Davis; photographs of H. Strecker and C. T. Ramsden from Henry Skinner. The following publications: Le Monde Social des Fourmis by A. Forel, 3 parts; The Structure and Life History of the Cockroach by Miall & Denny; Les Larves et Nymphes Aquatiques des Insectes d'Europe by E. Rousseau; Pterophoridae of California and Oregon by Lord Walsingham.

The President read a communication from the Council of the Academy of Natural Sciences of Philadelphia requesting the Society to appoint a committee to meet with other committees representing a number of other scientific societies to consider suitable methods for commemorating the 100th anniversary of the birth of Dr. Joseph Leidy. A motion was made and carried that the President appoint a committee of three of which he should be one for this purpose. The following were appointed: Henry Skinner, E. T. Cresson, Jr. and R. C. Williams, Jr.

Communications were read from Mr. C. M. Van Duzee and Mr. Theodore H. Frison in which they refer to types and paratypes of insects they are sending to the Society for its museum as the best repository for such material.

A motion was made and carried that a committee be appointed to make arrangements for a field day. Dr. Skinner appointed Messrs. Williams, Rehn and Cresson on this committee.

Mr. Robert J. Titherington was elected a member of the society.

Mr. Cresson exhibited several boxes of Paratypic Cynipidae (69 species, 268 insects and 210 galls) from the United States received from Mr. A. C. Kinsey.

Mr. Rehn gave an interesting account illustrated by lantern slides covering his recent trip with Mr. Hebard through the West and Southwest, showing the character of the collecting grounds, the topography and the vegetation of the districts covered.

R. C. Williams, Jr., Recording Secretary.

---

## Entomological Union of Stettin.

The Entomologischer Verein zu Stettin is sorely in need of funds to continue the publication of its well-known *Zeitung*. For that purpose it desires to sell single volumes or complete sets of Vols. 2-83. Those interested should address Prof. L. Krüger, Stettin, Museum, Hakenterrasse, Germany.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

Vol. XXXIV OCTOBER, 1923 No. 8

CONTENTS



# The Life-History of Pieris beckeri Edwards (Lepidoptera, Pieridae).

By Karl R. Coolidge, Hollywood, California.

*Pieris beckeri* is a common and widespread butterfly in the West, occurring in all the Pacific Coast states and ranging thence eastward into Nevada, Utah, Colorado and Arizona.

It is an abundant species in the desert and semi-arid regions of Southern California, also ascending the mountainous regions to a considerable elevation, but does not seem to frequent the sea-coast district to any extent. In the immediate vicinity of Los Angeles it is rare, and Mr. W. S. Wright did not report it in his list of the butterflies of San Diego County.

But in the back country, on both the Colorado and Mohave Deserts, it is a common thing. At Palm Springs, on the Colorado Desert, it seems to be practically continuously brooded and can be seen on the wing nearly every month of the year.

The past season a few fresh specimens were observed at Palm Springs in early January. The first week in March

another brood appeared and a third came into existence about the middle of April. The hot months of the desert, June, July and August, have not been studied entomologically, but as there are at least two more fall emergences it is safe to assume that there are at least seven broods in that region.

Mead, in Psyche, vol. 2, p. 183, 1878, gave a brief description of the larva and chrysalis of *beckeri*. Edwards, Butt. N. Am., vol. 2, p. 73, 1883, quotes Mead and gives figures of the mature larva and pupa, the larva as drawn and colored by Mead, while the coloration of the pupa is based on Mead's description.

Considering the wide range of the species there is no doubt an extensive assortment of food-plants, Mead stating that on the Mohave Desert larvae were found on various crucifers, but the following only are definitely known:

CAPPARIDACEAE.—*Isomeris arborea* Nutt.—Bladder Pod. A handsome but foul smelling plant common on the desert, and also frequent along the bluffs and hills near the coast.

BRASSICACEAE.—*Brassica nigra* (Linn.) Koch.—Wild mustard, an introduction from Europe. I think also that the well known loco weed, *Astragalus* spp., of the Fabaceae family, will eventually prove to be a food-plant. I have captured many females of *beckeri* about this, but as yet have no positive evidence of its use as larval food.

On June 17th, 1921, I caught 2 ♀ *beckeri* in Mint Canyon, which leads into the Mohave Desert, and brought them to Los Angeles. Both were confined with sprigs of the common wild mustard (*B. nigra*), and on the following day both began to lay freely—almost feverishly. By June 20th a total of 65 eggs had been laid, placed on the sprigs as follows:

| | |
|---|---|
| 27 on young flower buds. | 7 on stems. |
| 17 on under surface of leaves. | 4 on dried seed pods. |
| 5 on upper surface of leaves. | 5 on sides of confinement jars. |

The eggs hatched in five days, when the young larvae voraciously attacked the sprigs of mustard, eating all parts of it, but seeming to prefer the tender flower buds. The larvae were exceedingly active and nervous, eating almost incessantly, hardly appearing to pause for the periods of moulting, which were passed as follows:

| | |
|---|---|
| Larvae hatched June 24th. | Passed third moult July 3rd. |
| Passed first moult June 27th. | Passed fourth moult July 6th. |
| Passed second moult June 30th. | Suspended July 9th. |

Mead gives the duration of the pupal state as fifteen days, but my pupae began to disclose imagoes ten hours after the larval skin had been thrown off, and inside of twenty-four hours all the butterflies had emerged—a speed record as far as my experience goes.

*The Egg.*—In shape fusiform, but slightly less than twice as high as broad. The base sharply docked, .40 mm. in diameter; the greatest breadth, .50 mm., in the middle, whence the sides slope at first gently and then rapidly to the truncate summit, where the width is only .12 mm. The micropyle in a circular flat depressed field, .08 mm. in diameter. The rosette composed of a central circle, surrounded by four disconnected ovals, between and beyond which are larger roundish cells, and finally an edging of still larger transverse semi-lunar cells. Height of egg .96 mm.

Running longitudinally, a series of sharply defined but not greatly elevated straight ribs; on the sides these are .08 mm. equidistant, .018 mm. in height, and .02 mm. in thickness. Originating at the base the ribs, except in rare instances, reach the summit; occasionally one will terminate just before the apex is attained, when an oblique shoot connects it with an adjoining rib. The ribs vary in number, from thirteen to fifteen. Between the ribs a series of cross striae, straight, equidistant, about .01 mm. in thickness and .025 mm. apart, and with the longitudinal ribs forming regular quadrangular cells. Surface of egg punctulate.

Color, when first laid, a rather vivid lemon yellow, but at the end of twenty-four hours becoming more and more orange tinged. In forty-eight hours of a decided uniform orange coloration.

Of five eggs examined two had thirteen ribs, one had fourteen and two had fifteen. These eggs were laid by the same female.

*Larva, First Instar.*—Body cylindrical, largest in the middle, tapering gently and quite uniformly towards either extremity. Anal segment bluntly rounded, furnished with a few fine pointed pale hairs. Spiracles round, prominent, with a rather heavy black ringing, .015 mm. in diameter.

Head dark chestnut brown, shining, .32 mm. in width; clothed with a very few long slender sharp hairs, .22 mm. in length, and more numerous much smaller fine pale hairs, but .04 mm. in length; ocelli black; greatest height of head .26 mm.

Body furnished with four longitudinal series of broad, shining red brown mammiform elevations, each with a central high, truncate, conical

nipple, emitting hairs. These elevations slightly irregular in outline, but about .05 mm. in diameter on the average and arranged in the following series:

A laterodorsal series, placed anteriorly. A lateral series, on the thoracic segments anteriorly placed in line with the laterodorsals, but situated posteriorly on the abdominal segments. A laterostigmatal series placed anteriorly. In the above three series but one wart to a segment on either side. A substigmatal series, two to a segment; the anterior one of the normal size; the posterior one, situated a little above and slightly back of the middle, much smaller, only .02 mm. in diameter.

The hairs arising from these nipples black, very slender, slightly tapering and apically expanded into an oval club. But those of the laterodorsal row on the first thoracic segment taper gradually to a fine point, project forward slightly, and are much longer than the others, being .26 mm. in length. The other hairs are erect, .10 mm. in length, with the expanded tip .01 mm. in width.

Color of body at birth bright lemon yellow, but shortly after feeding, the ground color begins to submerge into a brownish ochre, or varying to a solid green, and minute irregular blotchings of red brown appear, these becoming more and more conspicuous as the stage proceeds. Prolegs and ventral surface bright lemon yellow; legs pale shining yellow, infuscated apically.

Length, at birth, 1.54 mm. Width at first thoracic segment .32 mm.; width at fourth abdominal segment .36 mm.; width at anal segment .28 mm.

The young caterpillar makes its egress by eating out a hole in the side, near the apex. Its first step is to turn and devour more or less of the egg shell, usually eating it down to the base, but at other times deserting it after a few nibbles.

*Second Instar.*—Head now greenish gray, shining, .54 mm. in width; armed with a number of papillae giving rise to pallid or infuscated hairs; the smaller papillae .017 mm. in diameter, with the arising hairs .06 mm. in length; the larger papillae .02 mm. in height and diameter, with the hairs .30 mm. in length; all the hairs slender and sharp. Ocelli pallid.

The series of warts now .12 mm. in diameter, on the average dark gray green, prominent. The arising hairs black, .14 mm. in length, .02 mm. in width at the tips, and ordinarily supporting a hyaline droplet.

In addition to the series of warts of the previous stage, the whole body is sprinkled with smaller warts, dark gray green, about .04 mm. in diameter on the average, which give rise to shorter tapering slightly clubbed hairs, about .10 mm. in length; these are mostly black, but along the substigmatal fold are colorless. Spiracles .02 mm. in diameter,

with a rather prominent luteous ring, and situated on a roundish gray patch, .04 mm. in diameter.

Color of body greenish yellow, of varying shades; the dorsal line clear pale lemon yellow, except when the whole body is solidly green, when the dorsal line is concolorous. Scatteringly mottled with patches of reddish brown. Ventral surface paler than above. Prolegs pallid. Legs pale gray green, with the apical portions pellucid.

Length, just after moult, 3.40 mm. Width at first thoracic segment .56 mm.; width at anal segment .40 mm.

*Third Instar.*—Head dark gray green, .90 mm. in width; the large hairs of head .52 mm. in length, black, with the tips colorless; the black tubercles giving rise to these .04 mm. in height and diameter. The shorter hairs of head mostly colorless and varying in size from .10 to .20 mm., and the black tubercles from which they arise are .02 mm. in height and diameter.

The larger series of warts now .24 mm. in diameter; the smaller warts .08 mm. in diameter. The hairs from larger warts .50 mm. in length; those from the smaller warts .16 mm. in length. The large hairs mostly black, especially in the dorsal region, but substigmatally many are colorless; for the most part the small hairs are colorless. Some still smaller dark tubercles scattered over the body, only .02 mm. in height and diameter, these giving rise to straight erect colorless hairs, .06 mm. in length, and enlarged at the tips into bulbous clubs. Spiracles .025 mm. in diameter, with a luteous ring, and as before seated on a roundish gray patch.

Color of body greenish yellow. The warts reddish brown, deep in tone, some almost purple. As before, scatteringly mottled with patches of reddish brown. Ventral surface concolorous with above. Prolegs subhyaline yellow. Legs dark brown, almost black,

Length 7.5 mm. Width at first thoracic segment .92 mm.; width at anal segment .68 mm.

*Fourth Instar.*—Head gray green, 1.46 mm. in diameter; the long sharp black hairs of head 1.10 mm. in length, arising from heavy black tubercles .16 mm. in height and .20 mm. in diameter. The shorter hairs of head vary from .14 to .35 mm. in length and are mostly white, with the basal papillae relatively smaller.

The larger warts now .34 mm. in diameter and .12 mm. in height, deep red brown, almost purple. The hairs from the larger warts .80 mm. in length, mostly black, especially in the dorsal region, with the apices colorless. The minute scattered black papillae .025 mm. in diameter, with the arising colorless clubbed hairs .10 mm. in length on the average. Spiracles suboval, .08 mm. in length, .005 mm. in width, seated on patches of deep gray green, surrounded by roundish patches of pale blue.

Color of body yellow green, of varying shades, but with the green

always predominating. Irregularly mottled as before now with patches of bright purple, especially conspicuous surrounding the larger warts. The segments divided into the usual subsections, indicated by rather faintly impressed lines, and the larger warts are arranged on these in fairly regular transverse rows. The segmental creases lined with bright orange, sometimes conspicuously so and again indicated only with a bright spot along the stigmatal line. The dorsal line of an even bright lemon yellow, more or less prominent sometimes quite obsolete. Ventral surface of a deeper green than above. Prolegs slightly paler. Legs basally clear gray green, the remaining portion brown black.

The mottlings of purple, to the naked eye, stand out prominently as purplish patches against the green ground color, and when the orange segmental linings are strongly present the larva is a handsome one.

Length 15. mm. Width at first thoracic segment 1.65 mm.; width at anal segment 1.10 mm.

*Fifth Instar.*—Head pale green, 2.32 mm. in diameter; densely studded with papillae of varying sizes, some .30 mm. in diameter and .28 mm. in height, others grading down to but .08 mm. in diameter; there are also a few scattered colorless papillae but .04 mm. in height and diameter, giving rise to hairs .34 mm. in length. The larger hairs of head 2.60 mm. in length, .04 mm. in width at base. The shorter hairs .60 mm. in length on the average. These head hairs colorless, but the larger ones are more or less blackish to one-half or two thirds their length, and all the hairs are sharp. The papillae of head black, with only now and then a colorless one, and are surrounded irregularly by blackish patches. The head sometimes with a mottling of golden yellow on the sides, generally inconspicuous and in none of the larvae developed into a definite prominent mark. Ocelli brown.

The warts, arranged transversely on the segmental subsections, vary considerably in size; the larger ones ovate and the smaller ones roundish; the largest about .50 mm. in diameter and .30 mm. in height. These warts purple-black.

The hairs from the larger warts 2. mm. in length, sharp, wavy. They are mostly white, to the naked eye appearing blue-white, but some are black or fuscous basally and to a half or slightly more of their length, this being especially so of those in the dorsal region. Some smaller papillae, brown basally, black-tipped, .04 mm. in height and diameter, giving rise to colorless hairs .50 mm. in length on the average. In addition, a host of minute pale greenish or greenish yellow papillae, from .02 to .03 mm. in height and diameter, projecting delicate colorless hairs of varying lengths, but perhaps .20 mm. in length on the average. These are particularly noticeable in the substigmatal region.

Color of body a rather vivid yellowish green, and as before, conspicuously mottled with bright purple, especially prominent dorsally. These irrorations increase in distinctness as the stage proceeds and even-

tually more or less obscure the ground coloration. Substigmatally the ground color is pale bluish-green. The dorsal line even, varying in conspicuousness and in color, from pale green to a light lemon yellow. Ventral surface pale blue green. Prolegs rather deep green. Legs pale gray green basally, tipped with reddish brown. Legs and prolegs encircled at their bases with bright golden yellow. Segmental creases broadly and conspicuously banded with bright golden yellow, growing more and more prominent as the stage proceeds. These golden bands ring the anterior portion of one of the two connecting segments, and fully cover the posterior subsections of the other adjoining segment. Spiracles oval, .20 mm. in length, .14 mm. in width, pallid, with a fine yellow brown ring.

Length, just after the moult, 21. mm. Width at first thoracic segment 2.40 mm.; width at anal segment 2.10 mm.

The mature larva is very handsome. The purplish irrorations have almost completely obscured the yellow green ground color, so that to the naked eye the larva has the appearance of being prominently and definitely banded alternately with transverse stripes of bright golden yellow and purple.

*Chrysalis.*—Head case and tongue distinctly greenish, with more or less brown intertinged. Thorax in color brownish green. Wing cases cream colored. First two abdominal segments gray white, the remaining segments green, somewhat brown-tinged, while others are tinged with bluish. Whole upper surface covered with minute shallow impressions, a narrow faint white dorsal line on the abdominal segments. Tongue surpassing the wing cases by only 1. mm. Cremaster testaceous, .80 mm. in length, .60 mm. in width, truncate, the hooklets .06 mm. in length, brown orange in color. Spiracles .36 mm. in diameter, pallid.

Length 13. mm. Breadth of thorax 4.60 mm. Breadth at third abdominal segment 5.20 mm. Height of dorsal tubercles 4.70 mm.

The pupa is of t'e usual *Pierid* type and Edwards quotes Mead in comparing it with *P. protodice,* as follows:

"Is of much the same general shape as that of *Pieris protodice* Bois., but less angulated; the front is terminated by a blunt point; the cephalic portion is rounded, with uneven surface, and with the dorsal surface of the thorax, is dark grayish brown; the ridge above the wing cases, which is quite conspicuous in *protodice,* is absent in *beckeri.*"

## Funds for the Entomological Society of London.

In view of the appeal for funds made on behalf of the Entomological Society of London by Dr. L. O. Howard in the NEWS for June, 1921, page 183, it is of interest to note from the English journals of the present year that the Society received £500 toward the housing fund from the Misses Chapman on behalf of their brother, the late Dr. T. A. Chapman, and a bequest of £1000 from the late Mr. Hamilton Druce, the income of which is to be devoted to the library.

# District of Columbia Diptera: Sciomyzidae.

By J. R. Malloch and W. L. McAtee, Washington, D. C.

The Sciomyzidae are flies of medium size, the wings with dark markings often developed as handsome reticulations, which frequent moist places from the smallest springy spots to the most extensive marshes. The aquatic larvae are pale, somewhat enlarged at one end, move freely on the bottom or through the water, and sometimes float upon it. The pupae are somewhat decanter-shaped, eventually float upon the surface, and then to the shore, where the adults later emerge.

Two revisions of the family (see bibliography, p. 234) have recently appeared in which keys and illustrations of the characters of these flies may be found. The present list contains about the same number of species as the New Jersey report (Johnson, C. W., Ann. Rept. New Jersey State Mus. 1909, pp. 796-797). Additional described species which apparently should be collected here are: *Melina albovaria* Coquillett, New Hampshire to North Carolina; *Melina grisescens* Meigen, Pennsylvania to Florida, and westward; and *Hoplodictya setosa* Coquillett, Masschusetts to Georgia.

The abbreviations P. I. and V. P. I. in the list mean that the species has been collected on Plummers Island, Maryland, or in the vicinity respectively. Nine species have been taken on the island and 8 others in the vicinity. The total number of species in the list is 21.

Genus **Pteromicra** Lioy.

P. apicata Loew.—District of Columbia, July, D. W. Coquillett.

Genus **Atrichomelina** Cresson.

A. pubera Loew.—Chain Bridge, Virginia, Sept. 8, 1912, F. Knab and J. R. Malloch; Sept. 18, 1921, Malloch; Dead Run, Virginia, March 14, 1915, at maple sap; June 18, 1913, R. C. Shannon.

Genus **Melina** Desvoidy.

M. annulipes var. similis Cresson.—District of Columbia, D. W. Coquillett.

M. nana Fallen.—Washington, D. C., Oct. 14, 1906; Maryland near Plummers Id., Aug. 22, 1916, McAtee.

M. tenuipes Cresson.—Cabin John, Maryland, March 25, April 11, 15, 1916, R. C. Shannon; Stubblefield Falls, Virginia, Oct. 23, 1921, Malloch.

### Genus **Chaetomacera** Cresson.

C. CLARA Loew.—A fairly common species; dates of collection range from June 11 to July 25. V. P. I.

C. ELATA Fabricius.—Chain Bridge, Virginia, June 12, 1912, McAtee.

C. PLEBEIA Loew.—Chain Bridge, D. C., June 12, Geo. M. Greene; Cabin John Bridge, Maryland, June 14, 1916, R. C. Shannon; Hyattsville, Maryland, Sept. 1, 1912, F. Knab and J. R. Malloch.

C. VICINA Macquart.—Many records, the season running from May 8 to September 19.

### Genus **Trypetoptera** Hendel.

T. PALLIDA Loew.—Fairly common; has been collected from May 19 to October 14. P. I.

### Genus **Monochaetophora** Hendel.

M. UMBRARUM Linnaeus.—Common everywhere in marshy spots; season March 9 to October 26. P. I. A single specimen was taken on a warm winter day, Jan. 2, 1916, at Maywood, Virginia, McAtee.

### Genus **Euthycera** Latreille.

E. ARCUATA Loew.—A common species; dates of collection from May 3 to Sept. 12. Variety *uniformis* Cresson has been taken several times in June. Both the species and variety, P. I.

### Genus **Limnia** Desvoidy.

L. COMBINATA Loew.—Dyke, Virginia, May 28, 1915, McAtee; Rock Creek, D. C., August 3, 1913, R. C. Shannon. Variety SPARSA Loew, Chain Bridge, Virginia, September 10, 1922; Vietch, Virginia, June 9, 1912, Malloch.

L. COSTALIS Loew.—Fairly common, season May 25 to September 15. P. I.

L. LOUISIANAE var. SEPTENTRIONALIS Melander.—Washington, D. C., August 17, 1913.

L. SARATOGENSIS Fitch.—The commonest species of the family; season May 18 to October 14. P. I.

L. SHANNONI Cresson.—Plummers Id., Md., Oct. 16, 1913, Oct. 28, 1915; Bladensburg, Maryland, Oct. 2, 1917, R. C. Shannon.

### Genus **Sepedon** Latreille.

S. ARMIPES Loew.—Maryland near Plummers Id., July 27, August 15, McAtee; Glen Echo, Maryland, July 23, August 6, Malloch.

S. FUSCIPENNIS Loew.—Many records, extending from July 14 to October 28. P. I.

S. PUSILLUS Loew.—Common; season runs from May 1 to October 4. V. P. I.

S. TENUICORNIS Cresson.—Numerous records from the Plummers Id. to Chain Bridge region, dates ranging from May 2 to August 22; has been taken also near Bladensburg, May 10, McAtee.

BIBLIOGRAPHY.

BANKS, N. At the Ceanothus in Virginia. Ent. News, 23, No. 3, March 1912, p. 110.
Lists *Tetanocera costalis;* see under *Limnia* of this paper.

CRESSON, E. T., JR. A revision of the nearctic Sciomyzidae (Diptera, Acalyptratae.) Trans. Am. Ent. Soc., 46, pp. 27-89, Pls. 1-3, March 31, 1920.
Records 17 species, 2 new, and 4 varieties, 1 new from our region.

LOEW, H. Die nordamerikanischen arten der Gattungen Tetanocera und Sepedon. Wien. Ent. Monats., 3, No. 10, Oct. 1859, pp. 289-300.
Lists 4 species of *Tetanocera*, 2 new, and 3 of *Sepedon*, all new, from the District of Columbia.

Monographs of the Diptera of North America, Pt. 1, Smiths. Misc. Coll., April 1862, 221 pp., 2 Pls.
Lists *Tetanocera pictipes* (= *Monochaetophora umbrarum*) from Washington.

MELANDER, A. L. Review of the nearctic Tetanoceridae. Ann. Ent. Soc. Am. 13, No. 3, Sept. 1920, pp. 305-332, Pl. 30.
Records 13 species and 2 varieties (one of the latter new) from our region.

## Two New Species of Psephenus Hald., with a Note on Narpus angustus Casey (Coleop.).

By FRANK E. BLAISDELL, Sr., San Francisco, California.

In 1893, Col. Casey described two new species of *Psephenus* from California (Coleop. Not., V, Annals N. Y. Acad. Sci., VII, p. 578.) At the present time are given two additional species, also from California.

**Psephenus lanei** new species.

*Form* moderately depressed, subcuneate-oval, narrowed anteriorly.

*Color* black; antennae toward base and first three joints of the maxillary palpi slightly paler; surface luster dull, feebly shining. Pubescence moderately abundant; hairs short and silvery on the body beneath; on the upper surface, nearly erect, sparse and rather stiff, longer hairs are intermixed with abundant small, short, semi-recumbent, apically pale hairs.

*Head* transverse, eyes prominent and rounded; raised apical margin evenly arcuate from side to side between the antennae, as viewed perpendicular to the surface; front broadly and moderately concave, punctures rather closely placed, subequal in size and rather small; deflexed edge of the front narrow and moderately inflexed, labrum about three times as long as the inflexed front and emarginate at apex as in *lecontei.*

Maxillary palpi fully three-fourths as long as the antennae; second joint elongate, at least four times as long as wide at apex. Antennae rather slender, not incrassate, and extending to about the pronotal base; joints four to ten inclusive, scarcely longer than wide, third obconical and about twice as long as wide near the apex; eleventh short oval.

*Pronotum* transverse, apex arcuate and about two-thirds as wide as the base; apical angles rather broadly rounded; sides moderately convergent anteriorly, broadly but not strongly arcuate and somewhat broadly sinuate a short distance before the base, thence arcuate to the basal angles, the latter obtuse and distinct and not in the least rounded; base rather strongly lobed at middle, thence broadly and rather strongly sinuate to the angles; disk almost evenly and rather moderately convex, distinctly impressed within the angles and more narrowly along the sides, most strongly so at the basal angles; punctures larger and smaller intermixed, the larger are subgranulate, more sparsely placed and give origin to the black hairs, the smaller to the pale hairs.

*Elytra* about one-third longer than wide, slightly widest posteriorly; sides feebly converging toward base, rather straight in basal half, thence arcuate to the less broadly rounded apex, sutural angles not evident; disk rather evenly and less than moderately convex, somewhat flattened apically and subexplanate laterally, less and narrowly so toward base, punctures fine, larger and smaller intermixed, the latter most abundant.

Sixth abdominal segment deeply emarginate at middle, emargination rounded at base, edges clothed with black hairs. Tibiae and tarsi slender.

Measurements.—Length (type) 3.5 mm.; width 2 mm.

*Holotype,* male, and one *paratype,* male, in my own collection. Type locality.—Juliaetta, Idaho. Collected on July 7th. 1922, by Mr. Merton C. Lane, of Ritzville, Washington, to whom I dedicate the species.

I have before me a series of six specimens of *P. lecontei,* collected in Maryland and Pennsylvania. *Lanei* is distinct in its very long maxillary palpi and different form of the pronotum. It resembles *lecontei* in the character of the pubescence and form of the labrum. In *lanei* however, the basal angles of the pronotum are distinct and not in the least rounded, and the pronotal sides are less convergent and more arcuate; the prosternal process is less sharply carinate between the coxae. In *haldemani* the front is longitudinally divided; in *falli* the vestiture is dense and the pronotal apex truncate and the disk evenly convex; in *veluticollis* the pronotum is velvety-black in the female. The female of *lanei* is not at hand.

**Psephenus calaveras** new species

*Form* oblong-oval, about twice as long as wide, moderately depressed.

*Color* black, under surface opaque; appendages and abdominal segments more or less fuscous or testaceo-fuscous, basal margin of the elytra slightly paler. Surface somewhat shining, head and pronotum opaque and velvety black. Pubescence dual as in the other species, finer and shorter than in *lanei* or *lecontei;* longer hairs semi-recumbent, paler ones very small and inconspicuous.

*Head* transverse, eyes very prominent and rounded; frontal apex arcuate, rather feebly reflexed; front broadly impressed, punctures rather dense, small and subequal in size, a few larger ones in the supraorbital region, where the hairs are long and overhang the eyes. A few large punctures are seen on the vertex. The frontal apex is arcuate from side to side and narrowly, evenly impressed, inflexed edge very short as viewed longitudinally from the front; the labrum is about twice as wide as long, impressed in the central area and the apex emarginate. The pubescence is abundant on the labrum and apical parts of the front. Second joint of the maxillary palpi about as long as the third and fourth taken together, antennae moderately short, extending to about the middle of the pronotum; joints four to eleven inclusive subequal in relative proportions, fourth and fifth smallest, thence the joints increase very slightly and gradually in size, scarcely incrassate; third joint triangulo-obconical and slightly elongate.

*Pronotum* transverse, about one-third wider than long; apex rather moderately arcuate and about two-thirds as wide as the base; apical angles broadly rounded into the apex and sides, the latter moderately convergent anteriorly, almost straight or very feebly and broadly sinuate in middle two fourths, thence arcuately continuous with the apical angles, posteriorly more strongly rounding to the basal angles which are obtusely rounded and somewhat prominent posteriorly; base broadly and evenly lobed at middle, thence broadly, evenly and distinctly sinuate laterally to the angles; disk rather evenly and very moderately convex, quite broadly impressed laterally and slightly reflexed, impressions wider and deeper within the angles, especially at the base, punctures very minute, scarcely larger than the base of the hairs, those for the larger hairs feebly subasperate especially at the periphery; hairs notably fine.

*Elytra* about one-third longer than wide, scarcely wider posteriorly; sides subparallel and feebly arcuate, deflexed in basal half beneath and behind the humeri, evenly and rather strongly arcuate posteriorly into the more narrowly rounded apex, sutural angles absent; base of each elytron arcuate and adapted to the sinuate pronotal base; disk very moderately convex, less so and rather flattened apically, punctures abundant and small, the larger giving origin to the coarser hairs; surface finely rugulose.

Beneath very abundantly clothed with fine, short, soft hairs. Propygidial segment broadly emarginate at apex. Fifth abdominal segment as a whole broadly arcuate, but feebly sinuate in middle two fourths. Tibiae and tarsi very slender.

Measurements.—Length 4 mm.; width 2 mm.

*Holotype* a unique female, in my own collection. This was secured from beneath a rock on the edge of the Calaveras River, near Lombardi's ranch, Calaveras County, California, July 18th, 1910. During the many years that I have collected along the mountain streams in the Sierras and elsewhere, this is the only specimen that I have ever collected. They are evidently very rare.

*Calaveras* is very distinct from any described species. Up to the present time I have referred it to *veluticollis* Casey. The punctures of the pronotal disk are excessively small, the minute hairs seem to arise directly from the surface. The long hairs of the supraorbital region appear to be more marked than in *lecontei;* the labrum is impressed at middle, not so in *lanei* and *lecontei*. In *calaveras* the two basal joints of the metatarsi are subequal and together about equal to the length of the last.

In *lecontei* the labrum is short and quite equal in length to the inflexed edge of the frontal apex (male); both longer and likewise quite equal in length (female). In the latter sex the pronotal punctuation is very fine, almost as in *calaveras* (female).

The six known species may be tabulated as follows:

Impression of the head longitudinally divided; elytra pale at base. California .......................................**haldemani** Horn.

Impression of the head not longitudinally divided; elytra uniform in coloration, except very narrowly on the basal margin

Sides of the pronotum strongly convergent, the apex not more than one half as wide as the base. Eastern United States .......................................**lecontei** Lec.

Sides of the pronotum feebly convergent, the apex wider, two-thirds to three-fourths as wide as the base.

Pronotum velvety black.

Sides of the pronotum evenly and feebly arcuate from base to apex; Pronotal punctures rather strong and dense anteriorly, becoming finer and sparse behind. California .........................**veluticollis** Casey.

Sides of pronotum straight or feebly sinuate in middle two fourths, anteriorly arcuately continuous with the rounded apical angles; apex arcuate; labrum impressed at middle; pronotal punctures scarcely recognizable. Female. California ....................... **calaveras** n. sp.

Pronotum dull and opaque, not velvety.

Sides of the pronotum broadly rounded and subparallel toward base, more convergent and nearly straight anteriorly; apex truncate; elytra with impressed lines, disk feebly elevated along the suture. Male. California .................................. **fallei** Casey.

Sides of the pronotum broadly arcuate, somewhat broadly feebly sinuate at middle; apex arcuate; elytra without impressed lines, not elevated along suture. Male. Idaho .................................. **lanei** n. sp.

**Narpus angustus** Casey.

Two specimens of this rare species were taken by the writer on July 23d, 1908, while collecting along the Russian River, Sonoma County, at Monte Rio. At that time the river was quite low and there were numerous side pools. One in particular was very prolific as regards the immense number of specimens that I secured from it; it was situated at the base of a clump of red alders and the many roots, both dead and living, in it formed an obstacle to its thorough exploration. The base of another and small tree, which had been felled and afterward washed out was in the bottom of the pool. It was from this that I took my two specimens of *Narpus*. There were many hundreds of specimens of *Hydroporus eximius* Mots. about the old stump; by the use of the net a large number of *Agabus lugens* Lec., *Ilybiosoma regularis* Lec. and *Helichus suturalis* Lec. were obtained. Col. Casey's specimen was found dead and mutilated. My capture is the first record of living specimens having been collected that I have any knowledge of. The species may have been taken by others but if so I have never seen any account of it.

---

**Flies Preying on Mosquito Larvae (Diptera: Muscidae, Culicidae)**

Having been instrumental in getting some work accomplished above Millbourne Dam on Philadelphia side, I took a picture of one of the breeding spots of *Culex pipiens* after the water had slowly receded. Half an hour afterwards flies (*Lucilia caesar*) commenced to feed on the larvae lying as thick as a pie.

But what is a spot of breeding ground about 20 feet long to an area of 4 acres? The men worked one day and are being used for other work the next day. The flies commenced laying eggs when I left the place.

H. HORNIG, Philadelphia, Pa.

# New and Known Species of Porphyrops from North America (Diptera, Dolichopodidae).

By M. C. VAN DUZEE, Buffalo, New York.

**Porphyrops slossonae** Johnson.

Psyche, Vol. xiii, p. 59, June, 1906 (*Leucostola*).

Mr. C. W. Johnson sent me a specimen labeled *Leucostola slossonæ* which proves to be a typical *Porphyrops*. It answers his description well.

This species is almost like *Porphyrops elegantula* Meig., having the same form of hypopygial appendages and antennæ; it is not quite as brightly colored, it differs in having the upper edge of fore femora black. The fore tarsi in *slossonae* are yellow with last four joints darker, but only the last joint black, the joints as 39-17-15-13-13; middle tarsi with their joints as 60-28-20-12-13; joints of hind tarsi as 47-50-32-20-14. First joint of anterior tarsi considerably enlarged below at tip. The fore femora have short, the middle ones longer, white hairs below, those on the middle pair nearly as long as the width of the femora. Middle tibiæ black on the whole of their lower surface, upper edge black on apical fourth. There is a row of six small black bristles on each side, back of the upper orbital cilia ending in the post-vertical bristle. Length 7.3 mm.

*P. elegantula* Meig., according to Dr. Becker, has the fore femora wholly yellow; hind femora and tibiae becoming blackish at tip; hind tarsi black, first joint shorter than second; first joint of fore tarsi thickened below at tip, as long as the four following joints (as long as the two following joints, Dr. Lundbeck) outer hypopygial lamellae simple, narrow, tapering, as long as the height of the hypopygium; inner appendages a little enlarged and hollowed at tip (spoon-shaped). *Elegantula* has been taken in Alaska by both Prof. Hine and Dr. Aldrich.

**Porphyrops barbipes** new species.

♂. Length 5.3 mm. Face narrow, silvery white; front green. Antennae black; third joint nearly as long as the face; arista as long as the antennæ. The long white beard abundant and reaching the upper fourth of the eye, the upper orbital cilia short, black.

Thorax green, shining, with a spot of white pollen on each side extending from the humeri to the suture and a blackish spot above the root of the wing; scutellum with four marginal bristles.

Abdomen green, apical segments almost black, spots of white pollen and long white hair on the sides. Hypopygium not very large, its outer lamellæ as long as the height of the hypopygium, curved, of equal width, not tapering, fringed with pale hairs; inner appendages not quite one-third as long as the outer, straight, blunt, divergent.

Coxæ, femora, hind tibiæ and hind tarsi black. Coxæ with long white hair, middle and hind pairs with a black thorn at tip; tips of fore and middle femora and their tibiæ yellow. Fore femora on posterior surface, middle pair below and hind ones on anterior surface with abundant, long, white hair. Fore tarsi yellow, infuscated towards their tips, first joint slightly compressed, a very little hollowed below beyond their middle and with a row of about seven blunt teeth on the middle of lower edge; joints of fore tarsi as 37-17-13-8-8. Middle tarsi black from the tip of first joint. Joints of hind tarsi as 48-37-16-15-15. Calypters and halteres yellow, the former with white cilia.

Wings very slightly tinged with brown; third and fourth veins approach each other a little but are parallel towards their tips.

♀. Two females that seem to belong with this male have the face wide, white, rounded below, its suture below the middle; third antennal joint about half as long as in the male; beard not conspicuous, except on lower part of the head; coxæ, fore and hind femora, and posterior tibiæ and their tarsi black; all trochanters, entire middle femora, and fore and middle tibiæ yellow; fore tarsi infuscated from the tip of the first joint; middle tarsi mostly blackish; wings as in the male, still more tinged with brown.

Described from one pair (male *holotype*, female *allotype*) taken at Machias, Maine, July 21 and 22; and one female found at Princeton, Maine, July 12; all were taken by C. W. Johnson and are in the collection of the Boston Society of Natural History.

**Porphyrops johnsoni** new species.

♂. Length 5-5.5 mm. Face narrow, silvery white. Front shining green. Antennæ black; third joint about as long as the height of the front; arista apical, a little longer than the antennæ. Beard long, abundant, white; upper orbital cilia black, rather short.

Thorax dark shining green; scutellum with four large marginal bristles. Abdomen green, its incisures black or bronze, hairs on its dorsum black, those on the sides and venter long and white. Hypopygium black, not very large; its outer lamellæ rather short, black, of about equal width to the tip, which is somewhat truncate; inner appendages small.

Coxæ black with long white hair, middle pair with black bristles at tip, these do not form a thorn. Femora black, fore and middle pairs with yellow tips, the former with long white hair on posterior surface; middle ones with long white hair on both anterior and posterior edges below. Hind femora with rather long, black, stiff hairs on outer surface and lower inner edge. Fore and middle tibiæ and most of their tarsi yellow. Hind tibiæ and tarsi wholly black. Joints of fore

tarsi as 37-11-9-4-10; of hind tarsi as 40-37-25-11-12. Calypters and halteres yellow, the former with white cilia.

Wings grayish; third and fourth veins bent so as to approach each other a little, but parallel towards their tips; last section of fifth vein as long as the cross-vein.

♀. A female that seems to belong with these males has the antennæ very nearly like the male's; face wide with its sides parallel, rounded below, its suture just above lower third; the white hair forming the beard, on the coxæ and on the fore and middle femora much shorter than in the male, the black hair on the hind femora also short.

Described from three males and one female. The *holotype,* a male, was taken at Lahaway, Ocean Co., New Jersey; the female (*allotype*) was taken by Nathan Banks, at Falls Church, Virginia, May 16; one of the other males was taken at Jeffrey, New Hampshire, June 18, and the other at Kingston, Rhode Island, June 17, by C. W. Johnson. Holotype and allotype in the author's collection.

**Porphyrops brevicornis** new species.

♂. Length 4 mm. Face rather wide above, narrow below, silvery white. Front green, dulled with gray pollen. Antennae black; third joint scarcely longer than wide at base, conical; arista apical, about twice as long as the antennæ. Beard sordid whitish, not very abundant for the genus; the black upper orbital cilia extend down to about upper fourth of eye height; there is only one pair of postvertical bristles.

Thorax green, dulled with brownish pollen and with a brown stripe on each side of the acrostichal bristles.

Abdomen green, with a few white hairs on the sides, that are longest on first segment. Hypopygium black; its outer lamellæ are long, narrow, brown, ribbon-like, of nearly equal width throughout, fringed with pale hairs on one side, if stretched out they would nearly reach the ventral edge of second segment; the inner appendages are a pair of straight organs, slightly widened at tip and reaching the ventral edge of fourth segment.

Coxæ and femora black, tips of the latter narrowly yellow. Fore and middle coxæ with long sordid whitish hair, middle ones without a thorn at tip. Fore femora with long delicate white hair on posterior surface, middle pair with only short hair. Tibiæ yellow, hind pair black at tip, the black shading into the yellow and reaching to or beyond the middle on posterior side. Fore and middle tarsi yellowish, darker at tip, the former just equal to their tibiæ in length, their joints as 28-13-12-9-9, first joint a little widened at tip below. Fore tibiæ

with rather long hair on lower surface. Middle tarsi with their joints as 32-23-15-10-9. Hind tarsi wholly black, their joints as 40-55-20-14-9. Calypters and halteres yellow, the former with white cilia.

Wings tinged with brown; third and fourth veins slightly arched so as to approach each other, being nearest together at tips; last section of fourth only a little arched, without a distinct bend; last section of fifth vein twice as long as the cross-vein.

♀. Face very wide, yellowish white; front nearly opaque with brown pollen. Antennæ as in the male; thorax dulled with brown pollen, the brown stripes can scarcely be traced, but the central band has less pollen. Coxæ blackish with very short pale hairs; fore femora yellowish on anterior, black on upper and posterior surfaces; middle femora wholly yellow, still the upper edge is dark; hind femora yellow with the tip black above; tibiæ yellow, hind pair with apical two-fifths black and slightly black at extreme base; tarsi colored about as in the male.

Described from two males and one female, taken by Mr. Cole at Hood River, Oregon, the males on June 2 and the female on April 21. *Types* in the author's collection.

**Porphyrops ornatus** new species.

♂. Length 5 mm. Face narrow, silvery white. Front green. Antennæ black, third joint as long as the face; arista apical, as long as third joint. Beard moderately long, white; the black orbital cilia reach down nearly to the middle of the eye, there are three postvertical bristles on each side,.

Thorax shining green with a brown stripe on each side of the acrostichal bristles; scutellum with two pairs of marginal bristles, the outer ones much smaller than the inner pair; in one male there is a pair of marginal hairs between the central bristles.

Abdomen green with bronze brown incisures and the usual white hairs on the sides. Hypopygium black with short, black, stiff hairs; its outer lamellæ long, slender, tapering, blackish with yellow base, fringed with pale hairs; inner appendages slender, curved, yellowish, reaching the ventral edge of fourth segment.

Coxæ black with white hair; middle pair with a long black thorn at tip. Fore femora black more or less yellow on anterior surface, broadly yellow at tip, their lower posterior surface with long white hair, upper posterior surface with three small black bristles near the tip. Middle femora and basal half or more of hind femora yellow, the latter with nearly the apical half black; middle and hind femora each with a few small yellow hairs below. Fore and middle tibiæ yellow, the former with a little silver pollen on posterior surface. Hind tibiæ black with basal half of upper and about basal third of lower surface yellow. Fore tarsi with the first two joints yellow, last four infuscated;

the first is much widened below at tip; second joint two-thirds as wide as long, being nearly as wide as the tip of the first; joints of fore tarsi as 33-12-11-9-6. Middle tarsi black from the tip of first joint, their joints as 48-27-17-9-9, the first joint has several longer hairs at base below. Hind tarsi wholly black, their joints as 48-40-21-18-14. Calypters and their cilia yellow; knob of halteres yellow, stem brown.

Wings slightly tinged with brown; third and fourth veins considerably bent, approaching each other and again separating just before their tips; last section of fifth vein one and one-half times as long as the cross-vein.

♀. Face wide, rounded below, its suture at its middle; antennæ small, third joint about as long as the two basal joints taken together; arista more than twice as long as the antennæ. Femora and tibiæ colored about as in the male, except that the hind tibiae are yellow with about apical third black; femora with short hair; fore tarsi plain, blackened from the tip of the first joint. Wings about as in the male.

Described from two males and two females; the males were taken at Colden, Erie County, New York, July 9 and 23; the females at Lancaster, Erie County, New York, June 2. *Types* in the collection of the author.

**The Nesting Habits of Odynerus pedestris Sauss, and Stenancistrocerus saecularis Sauss (Hymen.; Eumenidae).**

*Odynerus* or more correctly *Stenodynerus pedestris* was found nesting in a sumac twig A mud plug sealed the aperture of this burrow. Upon splitting the twig it was found that this was an old gallery made by the bee, *Ceratina calcarata*, and only the top 2¾ inches was used by the present occupant. This tenant had made a mud floor at the aforementioned point and another mud wall at the top for a plug. The space of 2¾ inches contained three cells, two of which had dead larvae, and the third had an adult wasp ready to emerge; this was the condition of the nest on August 7, 1922.

I was very much surprised when Mr. S. A. Rohwer identified this wasp as *S. pedestris*, since this wasp is described in our "Wasp Studies Afield" as one that burrows in clay banks. Both specimens were resubmitted for verification, the one that recently emerged from the twig, and the specimen whose behavior was described in the aforementioned work; reexamination proves that the inhabitant of the twig is *Stenodynerus pedestris* and the name of the burrower in the clay bank should be corrected to *Stenancistrocerus saecularis* Sauss.

I regret very much that this error has crept in, and the object of this note is to correct the name of the wasp, whose behavior is described on pages 332-334 of the above book to *Stenancistrocerus saecularis* Sauss. PHIL RAU, St. Louis, Missouri.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., OCTOBER, 1923.

**Duty on Insects Imported into the United States.**

We have had inquiries in relation to the import duty on insects and have had considerable trouble and annoyance ourselves in respect to this matter. When insects are addressed to the Academy of Natural Sciences of Philadelphia, they may or may not be held for duty, probably depending on the action or opinion of the customs officer. When boxes or packages are addressed to individuals, they are usually held for duty and the consignee notified to call and pay duty. The tariff law of 1922 in respect to insects for institutions is clear enough—it reads as follows: "1663. Specimens of natural history, botany and mineralogy, when imported for scientific public collections, and not for sale" (are free of duty). Insect eggs are also free. This probably means silk-worm eggs. The duty on insects, imported by individuals, is apparently ten per centum ad valorem,* at least that is the rate charged in Philadelphia. It

"Treasury Department.
Washington, September 15, 1923.

MR. HENRY SKINNER, President,
The American Entomological Society,
Logan Square, Philadelphia, Pa.

Sir:—

In reply to your letter of the 11th instant, requesting information as to the classification of insects imported by individuals, I have to advise you that if the insects are imported in crude condition and unmounted they would be dutiable at the rate of 10% ad valorem under paragraph 1459 of the tariff act, and if prepared in any manner or mounted at the rate of 20% ad valorem under the same paragraph.

Respectfully,

[Signed] McKENZIE MOSS,
Assistant Secretary."

Paragraph 1459 reads: "That there shall be levied, collected and paid on the importation of all raw or unmanufactured articles not enumerated or provided for, a duty of 10% ad valorem, and on all articles manufactured, in whole or in part, not specially provided for, a duty of 20% ad valorem."

would be interesting to know what is charged in other places, as in some cities they are said to come through free. Living pupae and chrysalids are liable to confiscation. Duty is charged on pins, whether for institutions or individuals, and the rate is thirty-five per centum ad valorem. We have found it impossible to get good insect pins in the United States. We would suggest that the U. S. Bureau of Entomology try to clarify these matters, as at present they are very unsatisfactory and very annoying.—HENRY SKINNER.

### Another Reference to Barbellion.

EDITOR, ENTOMOLOGICAL NEWS:

I was much gratified to see in your editorial for June a quotation from the pen of W. N. P. Barbellion, but I was disappointed that you did not call the attention of the reader to his posthumous work entitled "The Journal of a Disappointed Man." This teems with interesting remarks, entomological and otherwise, in which I am sure your readers will find much food for thought. May I quote one choice bit, entitled "The Entomological Society," on page 110?

"There were a great many Scarabees present who exhibited to one another poor little pinned insects in collecting boxes. . . . It was really a one-man show, Prof. ———, a man of very considerable scientific attainments, being present and shouting with a raucous voice in a way that must have scared some of the timid, unassuming collectors of our country's butterflies and moths. Like a great, powerful sheep-dog, he got up and barked, 'Mendelian characters,' or 'Germ plasm,' what time the obedient flock ran together and bleated a pitiful applause. I suppose, having frequently heard these and similar phrases fall from the lips of the great man at these reunions, they have come to regard them as symbols of a ritual which they think it pious to accept without any question. So every time the Professor says, 'Allemorph,' or some such phrase, they cross themselves and never venture to ask him what the hell it is all about." PHIL RAU, St. Louis, Missouri.

### Memorials to Godman and Salvin.

The NEWS for October, 1919, page 231, noticed the initiation of a movement to place a memorial tablet to Messrs. Godman and Salvin, founders and editors of the *Biologia Centrali-Americana*, in the British Museum (Natural History) and to establish a "Godman Memorial Exploration Fund." During the past summer we have received the report of the Executive Committee in charge of the fund. According to it, subscriptions received from 84 individuals, three business firms, the British Ornithologists' Union, the Entomological, Royal Geographical, Royal Horticultural, Zoological and Royal Societies, with interest, amounted to

£1272 13s. 1d. The total cost of the tablet is £470 and, after deducting various small expenses, there remains about £788 2s. 2d. for the Exploration Fund, which, as we stated in 1919, had its beginninig in a gift of £5000 from Dame Alice Godman and her daughters.

The bronze tablet was designed by Sir Thomas Brock and cast by Mr. F. Arnold Wright. Its place is to be on the right-hand side of the statue of Darwin, half way up the main staircase of the Museum, and the date of unveiling set for July 28, 1923. We have no information as to the size of the tablet, but a photographic reproduction of it shows a horizontal rectangular outline, the middle section of the upper edge arched and spanning a relief map of Central America, within a circular scroll bearing the words "Biologia Centrali Americana." Below this, to left and right, are profile portraits of Salvin and Godman respectively, facing each other, each with his initials and dates of birth and death below: O. S. 1835-1898, F. D. G. 1834-1919. Between the two portraits is the inscription: "To Commemorate the Services to Natural Science and to the Museum of Frederick Ducane Godman, D. C. L., F. R. S., and Osbert Salvin, F. R. S., this Tablet is placed here by some of their friends and admirers."

The purpose of the Godman Exploration Fund is to collect, or acquire by exploration, specimens for the Natural History Museum.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A. London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of The American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **13**—Journal of Entomology and Zoology, Claremont, Cal. **14**—Proceedings of the Zoological Society of London. **19**—Bulletin of the Brooklyn Entomological Society.

**20**—Bulletin de la Societe Entomologique de France, Paris. **24**—Annals de la Societe Entomologique de France, Paris. **29**—Annual Report of the Entomological Society of Ontario, Toronto, Canada. **31**—Proceedings of the Acadian Entomological Society, Truro, N. S. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **39**—The Florida Entomologist, Gainesville, Florida. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **47**—Neue Beitrage zur systematischen Insektenkunde. Ed. by G. Paganetti Hummler, Voslau. **49**—Entomologische Mitteilungen, Berlin-Dahlem. **50**—Proceedings of the United States National Museum. **52**—Zoologischer Anzeiger, Leipzig. **57**—Biologisches Zentralblatt, Leipzig. **59**—Journal of Agricultural Research, Washington, D. C. **61**—Proceedings of the California Academy of Sciences, San Francisco. **68**—Science, Garrison on the Hudson, N. Y. **76**—Nature, London. **78**—Bulletin Biologique de la France et de la Belgique, Paris. **80**—Revue Suisse de Zoologie, Geneve. **82**—The Ohio Journal of Science, Columbus, Ohio. **85**—The Journal of Experimental Zoology, Philadelphia. **88**—Occasional Papers of the Museum of Zoology, University of Michigan, Ann Arbor. **89**—Zoologische Jahrbucher, Jena. **90**—The American Naturalist, Lancaster, Pa. **101**—Journal of the Linnean Society of London. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **107**—Rivista del Museo de la Plata, Buenos Aires. **111**—Archiv fur Naturgeschichte, Berlin. **115**—Societas Entomologica, Stuttgart. **116**—Entomologische Zeitschrift, Frankfurt a M. **124**—Bulletin de la Societe entomologique d'Egypte, Cairo. **138**—American Museum Novitates, New York. **147**—Archiv fur Mikroskopische Anatomie und Entwicklungsmechanik, Berlin. **148**—Revista de la R. Academia de Ciencias Exactas, Fisicas y Naturales de Madrid.

**GENERAL. Adair, E. W.**—The study of insects. (Cairo Sci. Jour., xi, 133-46.) **Bequaert, J.**—Recent publications on tropical entomology. **19**, xviii 99-103. **Caesar & Ross**—Insects of the season in Ontario. **29**, 1922, 33-39. **Calvert, P. P.**—The geographical distribution of insects and the age and area hypothesis of Dr. J. C. Willis. **90**, lvii, 218-29. **Champlain, A. B.**—Fish-killing insects. (Nature Mag., ii, 119-20.) **Costa Lima, A de**—Catalog systematico dos insectos que vivem nas plantas do Brasil e ensalo de bibliographia entomologica brasileiro. (Arch. Esc. Sup. Agr. e Med. Vet., Nichtheroy, vi, 107-205.) **Crampton, G. C.**—Preliminary note on the terminilogy applied to the parts of an insect's leg. **4**, lv, 126-32. A comparison of the terminal abdominal structures of an adult female of the primitive termite Mastotermes darwinensis with those of the roach Periplaneta americana. **19**, xviii, 85-93. **Fowler, W. W.**—Obituary notice. **8**, 1923, 150-2. **Grandi, G.**—Gli insetti dei caprifichi. (Rev. Biol., Roma, v, 69-90.) **Herter, K.**—Untersuchun-

gen ueber den temperatursinn der hausgrille (Acheta domestica) und der roten waldameise (Formica rufa). **57,** xliii, 282-85. **Howard, L. O.**—A fifty-year sketch history of medical entomology. (Smith. Inst. Rep., 1921, 565-86.) **Locket G. H.**—Tactile vision of insects and Arachnida. **76,** cxi, 848. **McAtee, W L.**—Insects, Arachnids, and Chilopods of the Pribilof islands, Alaska. (U. S. Dep. Agr., Biol. Surv., N. Am. Fauna, No. 46, 128-244.) **MacGillivray, A. D.**—The value of landmarks in insect morphology. **7,** xvi, 77-84. The subcostal vein in the wings of insects. **90,** lvii, 371-74. **Maheux, G.**—Provancher, the Canadian Linnaeus—his life and works. **29,** 1922, 28-30. **Melander, A. L.**—Collecting insects on Mount Rainier. (Smith. Inst. Rep., 1921, 415-22.) **Rabaud, E.**—La capture des insectes par les plantes. **20,** 1923, 122-4. **Riley, N. D.**—Translation of Finkler's communication on the Head-transplantation in insects. **9,** lvi, 143-44. **Ross, H.**—Pflanzengallen. (Natur, Leipzig, xiv, 273-82.) **Scheerpeltz u. Schild.**—Mikroprojektionsmethoden. **124,** iii, 65-9 (cont.) **Snyder, L. H.**—Instinct and intelligence in nature. (Nature Mag., ii, 102-4.) **Weber, H.**—Zur gliederung des insektenthorax. **52,** lvii, 97-116.

ANATOMY, PHYSIOLOGY, ETC. **Boring, A. M.**—The varieties of Monecphora bicincta from the point of view of a cytologist. **5,** xxx, 89-92. **Junker, H.**—Cytologische untersuchungen an den geschlectsorganen der halbzwitterigen steinfliege Perla marginata. (Arch. f. Zellforschung, xvii, 185-259.) **Metz & Ferry.**—The parallel characters "crossveinless" and "vermilion" in Drosophila willistoni. **90,** lvii, 381-4. **Schrader & Sturtevant**—A note on the theory of sex determination. **90,** lvii, 379-81. **Sturtevant & Morgan**—Reverse mutation of the bar gene correlated with crossing over. **68,** lvii, 746-47. **Tamura, O.**—Morphologische studie chromosomen und zellkerne (Arch. f. Zellforschung, xvii, 131-64.) **Ward, L.**—The genetics of curly wing in Drosophila. Another case of balanced lethal factors. (Genetics, viii, 276-300.)

ARACHNIDA AND MYRIOPODA. **Chamberlin, R. V.**—Results of the Bryant Walker expedition of the Univ. Mich. to Colombia, 1913, and British Guiana, 1914. **88,** No. 133. **Elton, C. S.**—The colors of water-mites. **14,** 1922, 1231-39. **de Vecchi, B.**—Le ghiandole a secrezione interna bell 'acrania. (Rev. Biol., Roma, iv, 634-61.)

**Chamberlin & Banks**—Arachnida and Chilopoda of Pribilof islands. (See McAtee under General.) **Watson, J. R.**—An addition to the Thysanoptera of Florida—XI. **39,** vi, 58.

THE SMALLER ORDERS OF INSECTA. **Brethes, J.**—Un Dorypteryx nouveau de Buenos-Ayres. **20,** 1923, 117-9. **Brittain, W. H.**—The morphology and synonymy of Psyllia mali. **31,** 1922,

23-51. **Brues, C. T.**—The geographical distribution of the Onychophora. **90,** lvii, 210-17. **Carpenter & Phillips.**—The Collembola of Spitsbergen and Bear Island. (Proc. R. Irish Ac., xxxvi, 6, 11-21.) **Ferris, Banks, McAtee**—Malophaga, Anoplura, Trichoptera, and Mecoptera of Pribilof islands. (See McAtee under General.) **Karny, H. H.**—A new Liothrips from Trinidad. **11,** xii, 160-4. **Kelly, R.**—Thrips; An unpopular insect, treated popularly. (Vict. Nat., Melbourne, xl, 49-57.) **Klapalek, F.**—Plecopteres nouveaux. **33,** 1923, 21-9. Collections zoologiques du Baron Ed. de Selys Longchamps., Cat. Syst. et Descr., Fasc. iv, 2, Plecopteres, Fam. Perlidae. **Kotlan, A.**—Ueber die blutaufnahme als nahrung bei den Mallophagen. **52,** lvi, 231-33. **Longinos Navas, R. P.**—Insectos sudamericanos. **148,** xix, 255-67. **Perfiljew, P.**—Ueber den mechanismus der kiemenautotomie bei den larven einiger Libellen. **147,** xcviii, 283-91. **Snyder, T. E.**—Three new termites from the Canal Zone, Panama. **10,** xxv, 126-31. **Treherne, R. C.**—Notes on Frankliniella tritici. **29,** 1922, 39-43. **Weiss & Lott**—Notes on Trichothrips ulmi in New Jersey. **19,** xviii, 94-7.

**ORTHOPTERA.** **Bodine, J. H.**—Hibernation in Orthoptera. **85,** xxxvii, 457-76. **Carothers, E. E.**—Notes on the taxonomy, development and life history of certain Acrididae. **2,** xlix, 7-24. **Caudell, A. N.**—Grylloblatta in California. **4,** lv, 148-50. Phorticolea boliviae, a new myrmecophilous cockroach from S. America. **5,** xxx, 28-30. **Chopard, L.**—Recherches sur la conformation et le developpement des derniers segments abdominaux chez les orthopteres (Pub. with Insecta, Rennes, 1920.) **Hebard, M.**—Orthoptera of Pribilof islands. (See McAtee under General.)

**Rehn, J. A. G.**—North American Acrididae. Paper 3. A study of the Ligurotettigi. **2,** xlix, 43-92.

**HEMIPTERA.** **Britton, W. E.**—The Hemiptera or sucking insects of Connecticut. (Conn. Geol. & N. H. Surv., Bull. 34, 807 pp.) **Brittain & Whitehead**—Papers on the leaf hoppers of Nova Scotia. **31,** 1922, 57-72; 128-57. **Barber, G. W.**—Notes on Sinea diadema. **5,** xxx, 74-6. A preliminary report on the Hemiptera-Heteroptera of Porto Rico collected by the Am. Mus. N. H. **138,** No. 75. **Ferris & Kelly**—Some Coccidae from about the Gulf of California. **61,** xii, 315-18. **Laing, F.**—On some Psyllidae from the new world. **11** xi, 696-705. **Leonard, L. T.**—Mealy bugs on the roots and nodules of legumes growing in the field. **68,** lvii, 671-2. **MacGill'vray, A. D.**—The Maskell collection of Coccidae. **68,** lvi, 734-35. **Matheson, R.**—The wax secreting glands of Pseudococcus citri. **7,** xvi, 50-6. **Morrison, H.**—A report on a collection of Coccidae from Argentine. II. **10,** xxv, 122-26. **Obenberger, J.**—Analecta IV. **47,** ii, 113-5. **Parshley, H. M.**—Records of Nova Scotian hemiptera-heteroptera.

31, 1922, 102-8. **Speyer, E. R.**—Researches upon the larch chermes (Cnaphalodes strobilobus) and their bearing upon the evolution of the Chermesinae in general. (Phil. Trans. R. Soc. London, B, ccxii, 111-46.) **Van Duzee, E. P.**—Expedition of the Cal. Ac. Sci. to the Gulf of California in 1921. The Hemiptera. **61,** xii, 123-200.

**Drake, C. J.**—Two new species of Cantacaderia. **19,** xviii, 81-84. **Metcalf, Z. P.**—A key to the Fulgoridae of eastern North America, with descriptions of n. sps. (Jour. Elisha Mitchell Sc. Soc., xxxviii, 139-230.) **Morrison & Morrison**—The scale insects of the subfamilies Monophlebinae and Margarodinae treated by Maskell. **50,** lvii, Art. 17. **Osborn, H.**—Some confused species of Phlepsius and Eutettix. 82, xxiii, 160-2. **Patch & McAtee**—Homoptera and Heteroptera of Pribilof islands. (See McAtee under General.) **de la Torre-Bueno, J. R.**—A new North American Notonecta. **19,** xviii, 104-7.

**LEPIDOPTERA.** **Ainslie, G. G.**—The Crambinae of Florida. **39,** vi, 49-55. Striped sod webworm, Crambus mutabilis. Silver-striped webworm, Crambus praefectellus. **59,** xxiv, 399-414; 415-26. **Bell, E. L.**—Correction regarding Amblyscirtes alternata in Florida list. **19,** xviii 93. **Bryk, F.**—Lepidopterorum catalogus. Pars. 27: Baroniidae, Teinopalpidae, Parnassiidae. 247 pp. **Chittenden, F. H.**—Note on Evergestis straminalis. **19,** xviii, 84. **Dalla Torre et Strand.**—Lepidopterorum catalogus. Pars 28: Lepidarbelidae. Heterogynididae. 14 pp. **Fischer-Sigwart, H.**—Schmetterlinge vom Amazonenstrome in Brasilien im Zolfinger museum. **115,** xxxviii, 21-23. **Forbes, W. T. M.**—Trap-lantern record at Ithaca, New York. **4,** lv, 151-58 (cont.) Lepidoptera of Pribilof islands. (See McAtee under General.) **Goldschmidt, R.**—Einige materialien zur theorie der abgestimmten reaktionsgeschwindigkeiten. **147,** xcviii, 292-313. **Hamel, C. C.**—Distribution record on Macronoctua onusta. **10,** xxv, 141. **Kaiser, J.**—Notizen ueber die zucht nord-amerikanischer Catocalen und deren Nahrpflanzen. **116,** xxxvii, 13-4. **Kaye, W. J.**—New species of Trinidad moths. **14,** 1922, 991-98. **Mallock, A.**—Expansion of the wings of lepidoptera after emergence from the chrysalis. **76,** cxii, 7-8. **Ramsden, C. T.**—A new Kricogonia from Cuba. (Mem. Soc. Cubana Hist. Nat., "Felipe Poey," iv, 211-12.) **Snodgrass, R. E.**—The fall webworm. (Smith Inst. Rep., 1921, 395-414.) **Wegener, M.**—Ueber bildungsherde der hamocyten bei Lepidopterenlarven (Zerynthia polyxena.) **52,** lvii, 28-38. Die biologische bedeutung der nackengabel der papilionidenraupen. **57,** xliii, 292-301.

**Barnes & Benjamin**—A new race of Brenthis from Colorado. **4,** lv, 146. **Bird, H.**—New life histories, species and varieties in Papaipema. **4,** lv, 106-9. **Braun, A. F.**—The tineid moths of the Gulf of California expedition. **61,** xii, 117-22. **Heinrich, C.**—New Olethreutidae from eastern U. S. **10,** xxv, 105-22. **McDunnough, J.**— Notes

on the identity of Sphinx vancouverensis. New Canadian lepidoptera. **4,** lv, 147-48; 163-68. **Wright, W. S.**—The geometrid moths of the Gulf of California expedition. **61,** xii, 113-5.

**DIPTERA. Aldrich, J. M.**—Synonymy in the genus Cetema. **19,** xviii, 80. **Assmuth, J.**—Ametabolie und hermaphroditismus bei den Termitoxeniiden. **57,** xliii, 268-81. **Bezzi, M.**—The genus Urophora in America. **2,** xlix, 1-6. **Bromley, S. W.**—Observations on the feeding habits of robber flies. **5,** xxx, 41-5. **Brues, C. T.**—A new genus of myrmecophilous Phoridae, with notes on some related forms. **5,** xxx, 18-22. **Cole, F. R.**—Notes on the dipterous family Cyrtidae. **5,** xxx, 46-8. **Cook, W. C.**—Note on a bombyliid parasite of the pale western cutworm. **12,** xvi, 327. **Curran, C. H.**—Notes on some diptera. Observations on the oviposition of Senotainia trilineata. **4,** lv, 150; 174.—Relation of the biological and taxonomic studies in **Syrphidae. 29,** 1922, 30-33. **Doane, R. W.**—Syrphid larvae as pests. **68,** lvii, 741. **Franca, C.**—Observations sur le genre Phlebotomus. (Bul. Soc. Portugal. Sc. Nat., ix, 9-18.) **Greene, C. T.**—The larva and pupa of Microdon megalogaster. **10,** xxv, 140-41. **Herzog, M. A.**—Neues zur biologie der dasselfliege (Hypoderma bovis) und zur bekampfung der rinderhautbremsen oder biesfliegenseuche. (Rev. Biol., Roma, iii, 747-80, iv, 23-43.) **Jones & Bradley**—Observations on Tabanidae in Louisiana. **12,** xvi, 307-12. **Landis, E. M.**—A tabular account of the structural differences between the four larval instars of Culex pipens. **2,** xlix, 25-42. **Leon, N.**—Ueber die speichelpumpe der Culiciden. (Cent. Bakt. Parasidt. u. Infekt., xx, Abt. 1, 361-2.) **Lima, A. DaC.**—A new species of bat flea from Matto-Grosso. (Rev. Sci. Soc. Brasil. Sci., iv, 74-5, 1920.) **Malloch, J. R.**—Exotic Muscaridae.—IX. **11,** xi, 664-75. **Martini, E.**—Ueber einige fur das system bedeutungsvolle merkmale der stechmucken. **89,** xlvi, Syst., 517-90. **Parman, D. C.**—Biological notes on the hen flea, Echidnophaga gallinacea. **59,** xxiii, 1007-9. **Shannon, R. C.**—Non-human host records of Wohlfahrtia. **10,** xxv, 142. **Sturtevant, A. H.**—The probable occurrence of parthenogenesis in Ochthiphila polystigma. **5,** xxx, 22-7. **Weed, C. M.**—The house mosquito. (Nature Mag., ii, 49-50.)

**Alexander, Malloch & Walton**—Diptera of Pribilof islands. (See McAtee under General.) **Cole, F. R.**—Notes on the early stages of the syrphid genus Microdon. Notes on California Bombyliidae with descriptions of n. sps. **13,** xv, 19-20; 21-26. The Bombyliidae from the Gulf of California expedition. **61,** xii, 289-314. **Curran, C. H.**—Two new N. Am. diptera. (Oc. Pap. Boston Soc. N. H., v, 59-61.) **Hine, J. S.**—Horseflies collected by Dr. J. M. Aldrich in Alaska in 1921. **4,** lv, 143-46. **Johannsen, O. A.**—North American Dixidae. **5,** xxx, 52-8. **Johnson, C. W.**—The occurrence of Muscina pascuorum

in N. America. New species of N. Am. Cyrtidae. **5,** xxx, 1-5; 49-51. **Sturtevant, A. H.**—New species and notes on synonymy and distribution of Muscidae Acalyptratae. **138,** No. 76. **Van Duzee, M. C.**—New species of N. Am. Dolichopodidae. **5,** xxx, 63-73. The Pelastoneurus of North America. (Dolichopodidae). **7,** xvi, 30-49. New Dolichopodidae from the Gulf of California expedition. **61,** xii, 105-12.

**COLEOPTERA. Altson, A. M.**—On the method of oviposition and the egg of Lyctus brunneus. **101,** xxxv, Zool., 217-28. **Arendsen Hein, S. A.**—Larvenarten von der gattung Tenebrio und ihre kultur. **49,** xii, 121-59. **Benderitter, E.**—Scarabaeides de la collection Gillet. **33,** 1923, 5-8. **Bernet Kempers, K. J. W.**—Abbildungen von flugelgeader der coleopteren. **49,** xii, 71-115. **Brocher, F.**—Biologie et physiologie des dytiscides. **24,** xci, 329-35. **Bryant, G. E.**—Notes on synonymy in the Phytophaga. **11,** xii, 130-47. **Bugnion, E.**—Etudes relatives a l'anatomie et a l'embryologie des vers luisants ou Lampyrides. **78,** lvi, 1-53. **Chittenden, F. H.**—Notes on the distribution and habits of North American Phyllotreta. **10,** xxv, 131-39. **Holste, G.**—Das gehirn von Dytiscus marginalis. **104,** cxx, 251-80. **Hutchinings, C. B.**—Some notes on the biology of two buprestids infesting blackberry and hazel. Agrilus ruficollis and A. politus). **29,** 1922, 43-46. **Lucas, R.**—Coleoptera fur 1917. Mit nachtragen zu fruheren berichten. **111,** 1918, A, 5, 1-310. **Mutchler & Weiss**—Beetles of the genera Saperda and Oberea known to occur in New Jersey. (New Jersey Dept. Agr. Bur. Stat. & Inspect., Circ. 58.) **Paolo, L.**—Un caso di antenna bifida in un Cerambyx scopolii. (Atti Pont. Accad. Romana Nuovi Lincei, lxxxiv 130, 1921.) **Verhoeff, K. W.**—Ueber larventypen der C. und die auflosung der alten Malacodermata. **45,** xviii, 115-25. **Wickham, H. F.**—Coleoptera of Pribilof islands. (See McAtee under General.) **Wilson, C. B.**—Life history of the scavenger water-beetle, Hydrous triangularis, and its economic relation to fish breeding. (Bul. Bur. Fish., xxxix, 9-38.)

**Blaisdell, F. E.**—The Tenebrionidae from the Gulf of California expedition. **61,** xii, 201-88. **Champlain & Knull**—A new variety of Melanophila drummondi. (Buprestidae). Fragmentary notes on forest coleoptera. **4,** lv, 105; 112-15. **Davis, W. T.**—A new longicorn beetle from the Catskill mountains. **19,** xviii, 97-8. **Fall, H. C.**—Zarrhipis Le Conte. **4,** lv, 109-12. **Knull, J. N.**—Agrilus bilineatus var. carpini, new name. **4,** lv, 105.

**HYMENOPTERA. Bequaert, J.**—Vestigial pleometrosis in the North American Polistes pallipes. **19,** xviii, 73-80. **Bruch, C.**—Estudios mirmecologicos. **107,** xxvi, 175-211. **Dustan, A. G.**—A histological account of three parasites of the fall webworm (Hyphantria cunea). **31,** 1922, 73-95. **Leach, F. A.**—"Jumping seeds".

Plant growths that hop about like fleas. (Nat. History, New York, xxiii, 295-300.) **Mann, W. M.**—Two new ants from Bolivia. **5,** xxx, 13-18. **Safford, W. E.**—Ant acacias and acacia ants of Mexico and Central America. (Smith. Inst., Rep., 1921, 381-94.) **Santschi, F.**—Solenopsis et autres fourmis neotropicales. **80,** xxx, 245-73. **Thomson, J. A.**—The flower and the bee. Very important link in evolution. (Malayan Agr. Jour., xi, 98-101.) **Wheeler, E. W.**—Some braconids parasitic on aphids and their life history. **7,** xvi, 1-29. **Wheeler & Mann**—A singular habit of sawfly larvae. **5,** xxx, 9-13. **Williams, O. F.**—Ants have a number sense. (Guide to Nature, xvi, 33-4.)

**Bradley & Bequaert**—A new Dasymutilla from Arizona. **138,** No. 82. **Cockerell, T. D. A.**—The bees from the Gulf of California expedition. **61,** xii, 73-103. **Fox, C. L.**—Two new bembecids from the Channel Islands, Cal. **5,** xxx, 6-8. **MacGillivray, A. D.**—Sawflies from Alberta. **4,** lv, 158-62. New sawflies, from Oregon. **5,** xxx, 77-81. A century of Tenthredinoidea. (Univ. Illinois Bull., xx, No. 50.) **Muesebeck, C. F. W.**—A revision of the N. A. species of ichneumon flies belonging to the genus Meteorus. **50,** lxiii, Art. 2. **Picard, F.**—Contribution a l'etude des parasites de "Pieris brassicae." **78,** lvi, 54-130. **Smith, M. R.**—Two new Mississippi ants of the subgenus Colobopsis. **5,** xxx, 82-8. **Viereck, H. L.**—Hymenoptera of Pribilof islands. (See McAtee under General.)

---

A notice of the foundation of the Entomological Society of Brazil was given in the NEWS for October, 1922, page 240. The Society has recently published numbers 1-3 of the first volume of its BOLETIM (Rio de Janeiro, 1922) containing articles (in Portuguese) on Brazilian Lepidoptera, Diptera and Coleoptera which have been listed under our department of Entomological Literature.

A relatively new entomological journal is the NORSK ENTOMOLOGISK TIDSSKRIFT, published (in Norwegian) by the Norse Entomological Society at Christiania. The first volume is dated 1920.

---

GENERA INSECTORUM, fasc. 181. APIDAE, SUBFAM. PROSOPIDINAE, by GEOFFREY MEADE-WALDO. 45 pp., 1 col. pl., Bruxelles, 1923.

This, the first of the parts treating of the bees which has been promised since 1919, reached the writer on June 28. As a catalog of the known species it supersedes this part of the volume of Dalle Torre in 1896. The latter work listed 284 species in 6 genera, the present one has 19 genera (one of doubtful position) with 753 species. Australia has 300 of the species, including almost all of the genera excepting *Prosopis*, which appears under the generic name *Hylaeus*. *Euryglossa* has 88 species, the other genera from 1 to 17 each. The colored

plate shows representatives of 17 genera and some details of legs, mouthparts and antennae. No American species are illustrated.

A note by the editor states that since the death of Meade-Waldo the manuscript has been brought up to date by Prof. Cockerell, who has added the names of species recently described. A few notes on synonomy of American forms have been inserted by Prof. Cockerell.

Several typographical errors appear in the text. Two generic names are misspelled on the plate but corrected on the page of explanations of figures. The reference to figure 8 is omitted on page 11, and in line 7 of page 30, the use of "be" for "he is" might prove puzzling to one unfamiliar with English.

The description of habits is very brief (5 lines) and the statement that "The larvae are fed on a liquid food probably pollen regurgitated in the form of honey" would seem to imply that the bees were able to convert pollen into honey. Whether or not the bees make the cavities which they use is not stated. The nests which have been found by the writer indicate that our species use old cavities made by *Alcidamea*, *Ceratina*, *Odynerus*, etc., and he also has found them using the portion of a twig left empty by the *Alcidamea* above her cells.

One important comment is made by the author concerning the origin of the group. The short emarginate ligula has been regarded as evidence of the close affinity of these bees with the wasps. In two genera, *Meraglossa* and *Paleorhiza* the ligula of the male is acute, and in *Eupaleorhiza*, described (male only) from New Guinea by Meade-Waldo in 1914, the tongue is quite long and folded when in repose. The author suggests that perhaps the broad ligula is an adaptation associated with the habit of coating the nest with salivary secretions. Its recurrence in the *Colletinae* which have no other similarity to the *Prosopidinae* would seem additional evidence of such origin.

The treatment of the synonomy evidently is somewhat unequal. The species distribution of *Hylaeus* is as follows (Dalle Torre's numbers in the parentheses): palearctic 158 (161), nearctic 42 (12), neotropic 93 (13), ethiopian 47 (5), oriental (including Japan) 49 (11), Australian 119 (56), Hawaii 60 (12). The 42 North American species include the 20 recognized by Metz, the 11 placed by him as uncertain, 2 placed as synonyms and 2 unmentioned, also 7 since described. That the palearctic region has lost 3 species is due to the placing of many of those of Förster and others in the synonomy, but Europe still seems to have a rather generous allowance compared with North America (71 of the 158). Of Förster's species, 25 are retained, 5 of them as varieties. Of Cockerell's North American forms, 17 stand while 24 fall, but of his Australian ones, 82 stand and only 10 fall. All of the 52 described by Perkins from Hawaii are retained.

Much as one may admire the execution of such a work, the writer cannot help feeling that the plan of it is a mistake. He realized that

its circulation must be comparatively small, but was surprised when informed by the editor that only 150 copies of this part would be printed. In botany we have *Die Naturlichen Pflanzenfamilien,* a somewhat similar work except that it does not attempt to list all of the species and is not printed on such an elaborate scale. That publication covers the entire plant kingdom, was completed in 23 years (most of it in 13), and still can be obtained quite readily from dealers in second-hand books for about $100. In addition to the high cost of the GENERA INSECTORUM, and the length of time necessary to complete it, the small edition will make opportunities to secure complete sets quite rare.—O. A. STEVENS.

## OBITUARY.

WILLIAM EVANS, a fellow of the Royal Society of Edinburgh, died in that (his native) city, October 23, 1922, in his 72nd year. His interests in natural history were very wide and he contributed much to the knowledge of British insects in numerous notes and papers in the British journals, such as a series in the *Scottish Naturalist* for 1914 and 1915 dealing with insects found at the Scottish lighthouses. Mr. K. J. Morton, his fellow townsman, to whom we were indebted for a delightful evening spent in Mr. Evans' company, has written a sympathetic notice of his life (Ent. Mo. Mag., Jan., 1923).

At the meeting of the Entomological Society of Belgium of November 4, 1922, the death of the distinguished hemipterologist, A. L. MONTANDON, at Jassy, Rumania, was announced, but no particulars are given.

The Reverend Canon WILLIAM WEEKES FOWLER died June 3, 1923, in the vestry of his parish church, St. Peter's, Earley, Reading, England. "He had officiated at the early service" that day, but later "collapsed without warning, and life was extinct before medical aid could be summoned." He was born in January, 1849, son of the Rev. Hugh Fowler, attended Rugby, took a degree at Jesus College, Oxford, was ordained priest in 1875, and was master of Lincoln Grammer School, 1880-1900. He was appointed Canon of Welton Brinkhall in Lincoln Cathedral, in 1887. His best known works are *The*

*Coleoptera of the British Islands,* five volumes, 1887-1891, and a supplementary volume by himself and Mr. H. Donisthorpe in 1913; Rhynchota-Homoptera, parts of Vols. I and II, of the *Biologia Centrali-Americana,* 1894-1909; the general introduction to the Coleoptera and the volume on Cicindelidae and Paussidae in the *Fauna of British India* and the Languriidae in Wytsman's *Genera Insectorum.* He was President of the Entomological Society of London in 1901-02. His great activity, bodily and mental, and his readiness to assist fellow students in every possible way were outstanding features of his character. (Entom. Mo. Mag., July, 1923, Entom., July, 1923.)

---

The death of M. PAUL MABILLE at Perreux, France, on April 6, 1923, at the age of 88 years, was announced at the meeting of the Entomological Society of France of April 11. He was president of the Society in 1890 and in 1904 and was elected an honorary member in 1901. He was both a botanist and an entomologist, his chief works on insects being those on the Lepidoptera of Corsica (1867-69), of Madagascar, of Assinie, on the genus *Eupithecia* (1880), on the Hesperidae of the world, and an essay on the fauna of the island of Oleron (1906.) (Bull. Soc. Ent. Fr., 1923, No. 7, p. 102.)

---

The death of EUGENE BOULLET who published several works on the Hesperidae in collaboration with M. Mabille and, more recently, with M. F. LeCerf, was announced at the meeting of the same Society of February 28, 1923, but without any dates. He had formed a very important collection of Lepidoptera of the entire world which he gave to the Museum national d'Histoire Naturelle, bequeathing to the Laboratoire d'Entomologie thereof a sum sufficient to assure the maintenance of the collection.

---

At the same meeting was also announced the death of ED. BLANC, coleopterist, who made a successful entomological exploration of the Caucasus, Turkestan, parts of China and Siberia in 1890-91. (Bull. Soc. Ent. Fr., 1923, No. 4, pp. 48-49.)

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXIV NOVEMBER, 1923 No. 9

CONTENTS



# A New Species of an Achias-like Fly from Nicaragua, apparently belonging to the little-known genus Plagiocephalus (Diptera: Ortalidae).

By E. T. CRESSON, JR.

Among the material collected by Mr. Wharton Huber on the Nicaraguan Expedition of the Academy of Natural Sciences of Philadelphia, in the spring of 1922, was found a specimen of the curious pseudo-stalked-eyed flies, which upon close examination proved to be quite distinct from *Achias* and its allies. An examination of the literature relative to species of *Achias* soon established the similarity of this fly to the figure

of *Plagiocephalus lobularis*, given in Wiedemann's 1830 paper. That species was the only known *Achias*-like dipteron, excepting some species of the drosophilid genus *Zygothrica* occurring in the New World, which fact makes the finding of the present species all the more interesting. I give below a rather full description, in absent of detailed illustrations, endeavoring to include all characteristics of specific and generic importance.

### PLAGIOCEPHALUS Wied.

1830. Wiedemann, Achias, 12. pl. ii, f. 1a-b.
1843. Macquart, Dipt. Exot., ii (3), 213.
1873. Loew, Mon, Dipt. N. A. iii, 26.
1880. Osten-Sacken, An. Mus. Civ. St. Genova, xvi, 478.
1909. Hendel, Gen. Ins., fasc. 96, 47.
1911. Hendel, Gen. Ins., fasc. 113, 52.

This genus was erected for *Achias lobularis* Wied., a well marked species described from Brazil, but which apparently has not been seen since its discovery. Consequently, and in part owing to the insufficiently characterized description, the position of the genus has been little understood. Prior to Loew's and Osten Sacken's papers above cited, the genus had been associated with *Achias*, but Hendel following their suggestions, placed it in the ortalid subfamily Richardinae.

That the present species is closely related to *lobularis* is certain, but I have doubts as to it being congeneric. The fact that it has a distinctly plumose arista (that of *lobularis* being bare) alone suggests generic distinction and, furthermore, this may be substantiated by other characteristics not mentioned in the descriptions of *lobularis*. However, in the absence of more knowledge of *lobularis*, I hesitate to erect another genus for the present species. The pedal structure and the venation of *lobularis* may offer some valid generic characteristics, but one is guided only by the general figure of that species in these respects.

That the present species is a member of the Richardinae, is evident by the following characteristics: Vibrissa absent; median part of face flattened with a distinct transverse sulcus above the projecting epistoma; sutural impressions of mesonotum oblique; two pairs of post-dorso-centrals; mesopleural bristles well de-

veloped, but there are no propleurals nor sternopleural. Auxillary vein entering costa slightly beyond branch of second and third veins, at which point the first vein is thickened and nearly contiguous with the auxillary vein; first vein short and bare; anal cell short with its cross-vein convex, without acute lower angle. Abdomen rather slender basally.

**Plagiocephalus huberi** new species

Yellow; third antennal segment above, a transverse stripe on head above from eye to eye, including frontal bristles and ocellar tubercle, a similar stripe on occiput from eye to neck, including inner and outer verticals, brown. Mesonotum dark brown to black, opaque, marked with golden pollinose design as follows: a broad median stripe extending nearly to base of scutellum, then laterally, including postalar callus, then anteriorly, emarginated at suture and including humerus. There is also a vertical golden stripe over mesopleura but not including the shining sternopleura, a spot of same color on metapleura and a stripe below halteres. Scutellum sordid, sparingly golden pollinose. Metanotum dark with median pale vertical stripe. Pleura pale with dark vertical stripe behind prostigma and another before poststigma. Halteres nearly white. Abdomen (much shrunken and deformed) is dark with first segment and a median stripe on second and third, also lateral apical angles of second, pale. Legs entirely yellow but apices of tarsi darker. Wings yellow with pale veins immaculate but faintly longitudinally infuscated in first posterior cell.

Structurally, in general habitus, similar to Wiedemann's figure, but the head more slender as in Macquart's figure. Ocelli well developed, bristles strong and parallel and situated behind line of anterior ocellus; post-verticals divergent; inner verticals situated slightly beyond line of humeri, while the outer verticals are about midway between the former and the eyes; one frontal situated slightly beyond line of inner verticals; all these bristles well developed. Lunular margin straight, distinct to eyes where it becomes carinate, and the eyes are angular at that place. Antennae close together; third segment three times as long as second, and three times as long as broad, rounded apically; arista longer than third segment, shortly but distinctly plumose to tip. Face subopaque, medianly flattened; facialia produced laterally in form of a triangle, evanescing slightly beyond line of frontal bristle; no vibrissae or setulae on face. Epistoma concave, narrow but prominent, with a distinct transverse sulcus above; clypeus narrow, short, not as broad as the oral opening. Proboscis short; palpi broadly scapulate apically.

Thorax robust, as broad as long; fore coxae not attaining base of middle ones; all bristles strong. Mesonotum yellow setulose; two post-

dorso-centrals; two post-alars; one supra-alar; one presutural; one humeral; two noto-pleurals; one meso-pleural, and some pale hairs on the posterior margin and on the golden stripe. Scutellum triangular, flattened, with two diverging apical and one lateral bristles. Legs rather robust, especially hind femora. Fore legs without dorsal bristles, but with pale hairs; middle femora with few short flexor bristles and a preapical on tibiae; hind femora thickened, with stout flexor spines and several slender extensor bristles, without preapical on tibiae. Squama-thoracalis linear; squama-alaris small with long pale cilia.

Abdomen much shrunken and impossible of critical description.

Wings 8 mm. long. Costal cell narrow; auxiliary vein entering costa at break; no costal spine; stigmal area short; first vein bare, short, ending far before line of ante-cross-vein; second vein long; second costal section about three times as long as third. Third and fourth veins bare, converging so that first posterior cell is considerably narrowed apically; ante-cross-vein perpendicular, beyond middle of discal cell; ultimate section of fourth vein three times as long as preceding section; post-cross-vein straight, perpendicular; anal cell not longer than second basal, and its cross-vein convex, rounding into sixth vein. Alula moderate. Length.—8 mm. width of head 10 mm.

*Type.*—♂ ? Eden, Nicaragua, 14°-0'N., 84°-26' W., May 17, 1922, (Wharton Huber, [A. N. S. P., No. 6284.]

## An Interesting New Species of the Genus Melanoplus from Central Georgia (Orthoptera, Acrididae).

By Morgan Hebard, Philadelphia, Pennsylvania.

In June of the present year, Dr. Henry Fox, for the first time, examined a small upland grove, three miles east of Macon, Georgia, and about a mile north of a spot locally known as "Cross-Keys." He there secured eight specimens of a short-winged member of the genus *Melanoplus,* which represent a previously unknown species. This insect is described below and we take great pleasure in naming it in honor of Dr. Fox, whose observations and studies in the Orthoptera show a thoroughness, accuracy and scientific concept which places them with the most important contemporary contributions.

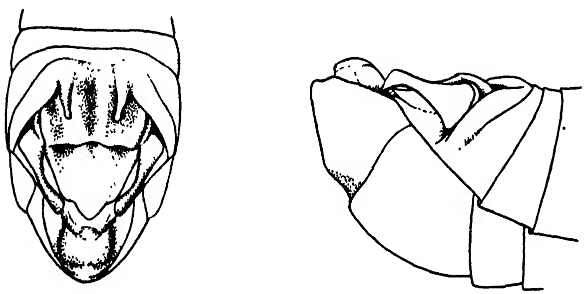
**Melanoplus foxi** new species. Text figures 1 and 2.

This insect is nearest *M. strumosus* Morse, being one of the species of the Puer Group having broadly oval tegmina, dull glaucous caudal tibiae and a truncate prosternal spine. Further agreement with *strumosus* is found in the general form, the

male cerci and subgenital plate being of the same general type, though showing striking differentiation. Superficially, the attingent tegmina give to the present insect a slightly stronger resemblance to *M. scapularis* Rehn and Hebard.

From *strumosus,* males of *foxi* are readily separated by the attigent tegmina, more slender furcula, which are separated at their bases by a considerable interval, much more elongate supra-anal plate, showing a different contour, particularly in the sharp transverse carina mesad, cerci straighter and slightly surpassing the apex of the supra-anal plate and similarly broadly truncate subgenital plate, which, however, is proportionately decidedly shorter.

*Type*: ♂ ; Macon, Georgia. June 4, 1923. (Dr. Henry Fox.) [Hebard Collection, Type No. 924.]



1

*Melanoplus foxi* n. sp. Dorsal (1) and lateral (2) views of apex of abdomen of male type. (Much enlarged).

Size and form closely resembling *strumosus,* very slightly less robust. Weak sulcation of vertex and frontal costa similar. Eye considerably longer than cheek, distinctly more than twice as long as infra-ocular sulcus. Pronotum with lateral carinae of disk not well defined, very feebly diverging caudad; medio-longitudinal carina percurrent, sharp and distinct; caudal margin of disk very weakly convex, however, very faintly less truncate than in *strumosus.* Tegmina abbreviate rotundate, not much longer than broad, very slightly overlapping. Extremity of abdomen moderately tumid and slightly upcurved. Furcula represented by a pair of slender, finger-like processes, parallel (or feebly diverging) and separated at their bases by a distance slightly less than the length of one of these. Supra-anal plate elongate shield-shaped, one and one-half times as long as greatest width; proximal half with a broad and decidedly concave medio-longitudinal sulcus and lateral

portions even more strongly concave, separated from distal portion by a sharp transverse carina; distal half showing concavity proximad on each side, its lateral margins weakly emarginate before the angulate apex. Cerci broad proximad but rapidly tapering, produced as a slender shaft, which is straight in lateral aspect but feebly incurved in dorsal aspect, its apical portion slightly thickened and produced to an acute point directed ventro-caudad. Subgenital plate broadly truncate-conical, longer than cercus but much shorter than supra-anal plate. Limbs as in *strumosus*.

The measurements of the type are given first. ♂. Length of body 16 and 15.8, length of pronotum 4 and 3.9, caudal width of pronotal disk 2.8 and 2.8, length of tegmen 3.6 and 3.3, width of tegmen 2.8 and 2.7, length of caudal femur 10.7 and 10.8 mm.

The most noteworthy color differences found between this insect and *strumosus* are the more reddish shade and apparently less strikingly paler face, genae and ventral portion of the pronotal lateral lobes of *foxi*. Vertex, occiput, disk of pronotum and tegmina blackish chestnut brown. A shining black, broad post-ocular bar extends from the eye to the principal sulcus of the pronotum. Eyes russet. Other portions of head, lateral lobes of pronotum and ventral portions of pleura vinaceous russet. Other portions of pleura blackish, with an oblique line of vinaceous-pink. Abdomen pecan brown, with an abruptly terminated black area on each side proximad. Ventral surface chamois. Cephalic and and median limbs vinaceous russet mottled with brown. Caudal femora mikado brown, the genicular areas and three transverse suffusions of blackish forming the usual external pattern, the ventro-external portion light pinkish cinnamon; ventral surface clear tawny, internal surface dorsad largely suffused with blackish. Caudal tibiae very dull glaucous-blue, spines black, spurs buffy with black tips.

Two paratypic males and five large immature individuals, representing both sexes, were also secured. Dr. Fox writes that "they were found in scrubby undergrowth, consisting predominantly of huckleberry, deerberry (*Polycodium sp.*), brake (*Pteridium aquilinum*) and oak sprouts (mostly *Quercus cinerea*, the upland willow oak), in an open grove of mixed longleaf pine and scrub oak. The locality is on nearly level upland, in the section known as the Sand Hills, a few miles below the 'Fall Line.' More than an hour's search was required to secure this small series. The insects appeared to be rather sluggish, leaping and then clinging to some twig or other convenient support, in much the same manner as other brachypterous forms."

# Some Peculiarities of the Dragonfly Fauna of Trinidad (Odonata).

By E. B. WILLIAMSON, Bluffton, Indiana.

Trinidad, in latitude between 10° and 11° north, with an area of about 2050 square miles, lies sixteen miles east of the northeastern extremity of Venezuela, its northern coast line on about the same parallel as that of the mainland lying west of it. To the south lies the delta of the Orinoco, whose southern affluents, together with the coastal streams of the Guianas to the southeast, rise from the highlands which are the northern watershed of the lower Amazon. The topography of Trinidad is varied, rising from sea level to a maximum at a few points of about 3000 feet. The flora is rich and generally luxuriant.

In 1912 with my father, L. A. Williamson, and Mr. B. J. Rainey, I made a small collection of dragonflies in Trinidad. This collection has not been fully worked up, but Dr. Ris has published on the Libellulines and I have recorded some of the Agrionines. These records in connection with the known distribution of dragonflies in northern Venezuela and Colombia and Central America, on the one hand, and in British Guiana and the lower Amazonian basin on the other, present some points of interest which students of other groups of the fauna of Trinidad may find significant. My first hand knowledge of the lower Amazonian dragonflies is based almost entirely on a very large and complete collection made by J. H. Williamson and J. W. Strohm, under the auspices of the University of Michigan, which collection is now being studied by J. H. Williamson and myself.

This note on the dragonflies of Trinidad is brief and general and it is not my purpose to discuss the distribution of any species in detail. So the region lying west and north of Trinidad, as mentioned in the preceding paragraph, will be referred to as *western,* while the Guianian and Amazonian regions will be referred to as *southern* when these regions are compared with Trinidad.

Dr. Ris records forty species of Libellulines from Trinidad, based on our collections. Of these one is insular, but not confined to Trinidad; twenty-six occur in both the southern and western regions; ten occur in the southern only; and three occur only in the western. Thus the predominance of the southern species, in view of the geographical position of Trinidad, is striking and rather unexpected. The three western species belong to two genera, *Dythemis* and *Macrothemis,* and are stream-frequenting species, but there are other species in Trinidad of these genera which occur in both the western and southern regions or in the southern region only.

Two genera of protoneurines with a single species of each occur in Trinidad. These two species occur only in the western region. They are stream species. None of the species of protoneurines of the southern region is known from Trinidad.

In the same way two species of *Hetaerina,* like all the species of the genus, stream dwellers, occur only in the western region, none of the numerous species of the southern region being known from Trinidad.

At a little woodland swamp near Cumuto, in Trinidad, we took three species of *Metaleptobasis.* Species of this genus frequent small woodland swamps, swampy forests, subject to seasonal inundation, and similar habitats found about sluggish, muddy, wet-weather woodland streams. They are inconspicuous insects usually resting near the ground on twigs or the upturned edges of fallen leaves or in grass or sedge clumps and sometimes rising to higher perches in bushes or low trees. Their flight is usually direct and rapid but for short distances only. The distribution of the three species found in Trinidad is exactly the opposite of what we find in the case of the stream dwelling protoneurines and Hetaerinas. For the three *Metaleptobasis* are all southern. One is known from British Guiana, another is known from far up the Madeira River, about as far south of the equator as Trinidad is north, and the third species is known also from far up the Madeira and from Manáos and Pará. The genus is known from the western region but none of the western species is known to occur in Trinidad.

Lacking a knowledge of the geology of Trinidad and such light as data on floral or other faunal groups may throw on these facts, I may yet hazard in a very diffident way a theory to account for the present dragonfly fauna. We may suppose the *Metaleptobasis* are members of a very old fauna, present when Trinidad was a part of the Guianian land mass or directly connected therewith. During the time of separation the stream faunas became extinct from some reason or, if they survived, they were later replaced by an invasion of better adapted stream species from a contiguous region of similar geographical position and similar climatic conditions, that is, from north-eastern Venezuela.

[The following data bearing on the theory proposed by Mr. Williamson are added at his request. F. M. Chapman (Bull. Amer. Mus. Nat. Hist. VI, p.7, 1894) lists 194 species of land birds common to Trinidad and the continent of South America. Of these: 153 are found in both Guiana and Venezuela, 25 in Venezuela but not in Guiana, 11 in Guiana but not in Venezuela. He holds that the Trinidad avifauna "belongs in the Colombian rather than in the Amazonian subregion." He does not consider the relations of parts of Trinidad separately. R. T. Hill (Bull. Mus. Comp. Zool. XXXIV, 1899) thinks that "Trinidad, Tobago and the adjacent islands were severed from the South American coast" in late Miocene and Pliocene time (p. 214). "The continental coastal plains of South Florida, Mexico, Yucatan, Costa Rica and Trinidad were veneered during Pliocene time with a coating of oceanic debris composed of shells and calcareous muds" (p. 217). Wheeler (Amer. Mus. Novitates, No. 45, New York, Sept. 7, 1922, p. 1) says: "the ant fauna of Trinidad . . . is in great part identical with and probably quite as rich as that of the adjacent Venezuelan coast."—EDITOR.]

## Collecting in the Southwestern United States.

DEAR DR. SKINNER: I am making a belated and hurried collecting trip through the Southwest—Texas, Arizona, and California. On arriving here, was fortunate in getting the services of a U. S. Forest Ranger (on vacation) and his Ford auto. Have been into the Catalinas at various points to 6000-7000 feet; the Santa Ritas, east and west slopes; the Huachucas (Carr and Ramsey canyons); Nogales, Patagonia, and other points, I looked principally for *Psychidae*, but have a lot of other material including *Megathymus* and other interesting diurnals. Saw Biederman in Carr Canyon, and the Magny brothers, just below him. Didn't find your big *Psychid*, which has apparently disappeared from the station for it. Barnes has it, I believe, from elsewhere. I've picked up some flies for Mr. Cresson, and some dragon flies for Dr. Calvert. Shall hope to tell you about my Huachuca experiences soon after my return in late October.

Yours very truly,

FRANK M. JONES, Wilmington, Delaware.

# New Tachinidae from Texas (Diptera).

By H. J. REINHARD, Texas Experiment Station, College Station, Texas.

## PARATACTA new genus.

Related to *Atacta* Schiner. Abdomen, thorax and head with distinct macrochaetae. Palpi well developed, proboscis slender, shorter than height of head. First vein bare, sides of face with bristly hairs on the lower half, apical cell open, ending well before wing tip. Eyes bare. Front of male greatly narrowed above, about equal to one-half the width of either eye, in female one and one-half times as wide as either eye. Ocellar bristles present, proclinate. Lowest frontal bristles about opposite the middle of second antennal joint. Antennae reaching to lower third of face, vibrissae rather weak, somewhat approximated, situated less than one-half the length of second antennal joint above oral margin. Facial ridges practically bare, only one or two bristles at the base above the vibrissae. Cheeks in the female about one-third, in the male one-fourth, as wide as eye height. Wings of normal shape, whitish hyaline, costal spine obsolete. Hind tibiae ciliate on the post-exterior edge. Type of genus, *Paratacta facialis* new species.

**Paratacta facialis** new species.

♀. Black, the first two antennal joints, palpi, scutellum and fourth abdominal segment, except at its base, yellow. Frontal bristles diverging abruptly at base of antennae, cruciate, except the vertical pair. Two pairs of orbitals, and a pair of posteriorly directed macrochaetae situated outside of the frontal rows about mid-way between the hind pair of orbitals and the anterior ocellus. Inner and outer verticals strongly developed. Antennae separated at base by a carina, third joint black, except at base, slightly shorter than second. Arista bare, thickened on basal third, the penultimate joint slightly longer than broad. Sides of face at narrowest part nearly one-third as wide as median depression, bearing several irregular rows of bristly hairs extending from the lowest frontals nearly to lower end of the eyes. Proboscis moderately long, distal segment rigid, shining black, labella fleshy, yellowish; palpi spatulate.

Thorax gray pollinose, dorsum with five black vittae. Three postsutural dorsocentral and four sternopleural macrochaetae. Scutellum gray pollinose, with three pairs of long marginal macrochaetae and a smaller discal pair, dorsum covered with sub-erect bristly hairs.

Abdomen short, broad, gray pollinose, clothed with coarse reclinate bristles, all macrochaetae marginal, large and erect. The first two segments with the usual pairs, third with a marginal row and the fourth with a submarginal row.

Legs black, knees yellowish, middle tibiae with three macrochaetae on the front side near the middle, pulvilli short.

Wings whitish hyaline, veins yellow, all except third bare, the latter with two or three bristles at the base. Hind cross vein nearly straight, nearer to bend of fourth than to small crossvein. Apical cell open, ending distinctly before wing tip. Bend of fourth vein rounded, without a stump or fold. Calypteres whitish, tinged with yellow.

Total length 7 mm.

♂. Similar to female except as noted in the generic description and as follows: Parafrontals with numerous long slender black hairs, no orbital or outer vertical bristles present, third antennal joint as long as second. Eyes larger and the facets on the upper half enlarged.

Described from one male and one female specimen, the former not perfect. Collected at Balmorhea, Texas, August 4, 1922. (C. S. Rude). *Type,* a female, deposited in the U. S. National Museum, Washington, D. C. This species differs from *Atacta* principally in having the parafacials hairy, and is generally much less robust.

**Xiphomyia texana** new species.

♀. Length 6 to 7 mm. Eyes bare. Front nearly as wide as either eye, faintly yellow pollinose, except on the outer borders, vitta broad, occupying about one-third the width of the front, opaque, brownish-black. Ocellar triangle yellow pollinose, with numerous short black hairs, and a pair of weak proclinate bristles. Two pairs of orbital bristles. Frontals in two rows, directed posteriorly and descending slightly below the base of third antennal segment. Parafacials, cheeks, and median depression cinereous. Antennae nearly as long as face, black, third joint slightly more than twice as long as second. Arista black, thickened only for a short distance beyond the base, microscopically pubescent on less than basal half, penultimate joint not longer than broad. Facial depression rather large, ridges diverging strongly downward, bearing four or five bristles above the vibrissae. The latter large and strongly cruciate, situated on level with the oral margin and lower end of the eyes. Sides of the face bare and narrow. Proboscis short, labella fleshy, yellowish; palpi brownish at base, yellow apically. Cheeks narrow, about one-fifth as wide as eye height. Posterior orbits and occiput cinereous.

Thorax black, the pollen on dorsum tinged lightly with yellow, four distinct vittae, the outer pair broad and interrupted at suture, pleurae

thinly gray pollinose. Four postsutural dorsocentral and three sternopleural macrochaetae. Scutellum black, bearing three pairs of marginal macrochaetae, the posterior pair extending almost to base of third abdominal segment, the apical pair small or obsolete.

Abdomen somewhat conical, clothed with reclinate bristly hairs, last three segments white pollinose on base, shining black apically, with both marginal and discal macrochaetae; the latter are sometimes asymmetrically placed. The piercer strongly developed, when unsheathed extends forward to second abdominal segment.

Legs black, middle tibiae with one bristle on the front side near the middle, hind tibiae sub-ciliate.

Wings whitish hyaline, costal spine inconspicuous, veins yellow. Third vein with two or three bristles near the base, all others bare. Posterior crossvein sinuous, nearer to bend of fourth than to small crossvein. Apical cell open, ending well before wing tip. Fourth vein nearly straight beyond bend, not distinctly appendiculate, but sometimes with a very short rudimentary stump at the bend. Calypteres white with a faint tawny tinge.

Described from three female specimens, collected at College Station, Texas, September, 1917, July, 1918, and October, 1921. (H. J. Reinhard). *Type,* a female, deposited in the U. S. National Museum, Washington, D. C. This species is evidently near *gladiatrix* Townsend, but differs in the color of the face, scutellum, abdomen, etc., the piercer is not as long, and discal bristles on all abdominal segments except the first.

**Metachaeta cinerosa** new species.

♂. Black, palpi, proboscis and base of third antennal segment, yellow. Front at vertex as broad as either eye, thinly gray pollinose, subshining, vitta opaque, brown, rather broad and extending around sides of ocellar triangle, the latter also gray pollinose and sub-shining. Ocellar bristles small, directed forward. Frontal bristles descending to tip of second antennal joint, usually two pairs of orbitals, the posterior pair sometimes very small. Cheeks, facial depression and sides of face gray pollinose. Antennae as long as face, third joint four or five times as long as second, convex on the front edge. Arista yellowish, short and thickened to the middle, densely clothed with short microscopic pubescence, the penultimate joint about as broad as long. Sides of face narrow, with a row of macrochaetae extending from the lowest frontal bristles to the lower corner of the eyes. Vibrissae large, cruciate, inserted on the oral margin, one or two bristles above each Cheeks about one-third as wide as eye height. Proboscis short and fleshy; palpi slender, not thickened apically. Eyes apparently bare, but with a few short microscopic hairs.

Thorax thinly gray pollinose, dorsum sub-shining, with three pruinose vittae in front of the suture, the middle one extending postsuturally about half way to base of scutellum. The latter black, shining, bearing three pairs of marginal macrochaetae.

Abdomen elongate-ovate, shining black, narrow bases of second and third segments gray pollinose, all segments with marginal macrochaetae situated somewhat before the posterior border of the segments. No true discals present.

Wings hyaline, tinged with yellow at the base, costal spine strongly developed, veins yellow. The first vein bristly on basal half, third vein with bristles almost to small crossvein, all others bare. Posterior crossvein nearly straight, nearer to small crossvein than to bend of fourth, the latter without an appendage or fold. Last section of fifth vein more than one-half as long as the preceding section. Apical cell closed and long petiolate, the third vein ending near to wing tip. Calypteres white, with a tawny tinge.

Legs black, front tarsi considerably dilated, pulvilli and claws very short. Middle tibiae with a single bristle on the front side near the middle, hind tibiae not ciliate. Total length 4 mm.

Described from four male specimens collected at College Station, Texas, May, 1917, June, 1919, and March, 1921. (H. J. Reinhard). *Type*, a male, deposited in the U. S. National Museum, Washington, D. C. This species differs from ***helymus*** Walker, in having hyaline wings, pruinose vittae on thorax, no discal macrochaetae on abdomen, and the intermediate segments of the latter pollinose on base.

**Hunting Rare Beetles and Bugs Above Clouds (Coleop.).**

Howard Notman, of 136 Joralemon Street, Brooklyn, New York, although now possessing one of the largest collections of preserved insects in the Western Hemisphere, still continues his quest for rarer species (July, 1923). The accompanying "snap shot" caught the entomologist examining a carabus beetle, an almost extinct species which he recently found under a rock on the top of Altyn Mountain in Glacier National Park. Mr. Notman will remain in this Rocky Mountain region the rest of the summer adding to his collection which now numbers 75,000 insects. He has been gathering this collection since boyhood. He has 5,000 varieties of beetles. Instead of having a large library room as most men of his financial circumstances do, he has built one commodious room on the top floor of his Brooklyn house which he devotes to his collection. He keeps them in a score of long show cases. HOKE SMITH, St. Paul, Minnesota.

# Two Fossil Hymenoptera from Florissant (Vespidae, Megachilidae).

By T. D. A. Cockerell, Boulder, Colorado.

The wasp and bee now described, from the Miocene shales of Florissant, Colorado, belong to the Colorado Museum of Natural History, and were kindly placed in my hands for study by Director J. D. Figgins.

**Palaeovespa relecta** new species.

Length 17.5 mm.; anterior wing 10.7 mm.; first discoidal cell slightly over 5 mm.; length of marginal cell 3 mm.; prothoracic lobes not striate; abdomen broad at base as in *Vespa*. Head and thorax black; antennae stout, ferruginous, dark at extreme base; first two segments of abdomen pallid, with small lateral dark markings; segments 3 to 5 with broad dark bands, about as broad as the intervals between them, each with a broadly rounded lobiform extension posteriorly on each side, and at posterior middle a very minute point easily overlooked; apex dark. Wings clear, suffusedly somewhat dusky along upper margin; nervures light ferruginous; marginal cell produced and narrowly pointed as usual in genus; end of first discoidal not more oblique than in *Vespula;* second recurrent nervure ending much more than half way from first recurrent to end of second submarginal cell.

The following measurements are in microns: Second submarginal cell on first discoidal, 208, on second (third of many authors) discoidal, 560, from second recurrent to end, 320; width (depth) of marginal cell, 690; second submarginal on marginal, 384; third submarginal on marginal, 720.

This is an extremely interesting species, for several reasons. Among the species of *Palaeovespa,* it falls next to *P. gillettei* Ckll., but that has the abdomen black, with narrow light sutural bands, and differs in various details. The abdominal bands of *P. relecta* are lobed posteriorly as in the living *Vespula consobrina* Sauss.; in *V. germanica* Fabr. the lobes have become elongated and basally constricted, or cephaliform; in *V. vulgaris* L. they have become spots. The posterior median point so conspicuously developed in *Vespula* is a minute dentiform process on the hind margin of the bands of *P. relecta.* The slender apex of the marginal cell, and the position of the second recurrent nervure, place *P. relecta* in *Palaeovespa,* but *Vespula* is divided into two groups according to the position of the second recurrent. In true *Vespula,* with short malar space, the second recurrent ends about midway between the first and the end of the second submarginal cell. I have examined *V. occidentalis* Cress. (San Ignacio, New Mexico, at flowers of

plum, May 4.). *V. germanica* Fabr. (The Mount, Funchal, Madeira, Dec. 28), *V. vulgaris* L. (Winfrith, Dorset, England, Oct. 11), and *V. consobrina* Sauss. (Buford, Colo.). In Rohwer's *Dolichovespula,* which may be taken as a genus, not only is the malar space long, but the second recurrent is more than twice as far from the end of the second submarginal as from the first recurrent. I have before me *D. maculata* L. (Buford, Colo.). and *D. diabolica* Sauss. (Boulder, Colo., and Las Vegas, N. M.). With these structural differences, go others in nesting habits. In respect to the position of the recurrent nervures, *Dolichovespula* stands midway between *Vespula* and *Palaeovespa,* and therefore presumably represents the latest stage of evolution.

**Heriades mersatus** new species.

Length 6 mm.; anterior wing 3.8 mm.; base to stigma 2.2 mm.; width of head 1.5 mm., of abdomen not quite 2; length of abdomen 2.7 mm. Head and thorax black; abdomen pale reddish, darkened at apex and base; legs pale ferruginous; wings clear, nervures ferruginous; antennae stout; head and thorax closely and strongly punctured, as in modern *Heriades,* the punctures of thorax about 24 microns in diameter.

The following measurements are in microns: width of flagellum, 160; width (depth) of marginal cell, 304; straight section of basal nervure not greatly shorter than the curved (lower) section, the latter 416; length of marginal cell, 976; first intercubitus to end of marginal cell, 800; greatest length (diagonal) of first submarginal cell, 704; length of second submarginal, 624; second submarginal on marginal, 272; second recurrent before end of bulging second submarginal about 50 (as in the living *H. truncorum,* but in the fossil *H. halictinus* Ckll. the nervure is at end of cell). The first recurrent nervure joins second submarginal cell at distance from its base equal to about half intercubitus, as in *H. halictinus.* The nervulus, placed typically for the genus, is a very little basad of the basal nervure, and slightly arched outward. The first discoidal cell is 944 long.

Nearest to *H. halictinus* Ckll., among the Florissant fossils, but differently colored, and with different wing measurements. The lower section of basal nervure is not greatly curved.

This makes the sixth fossil *Heriades* from Florissant, while in the modern fauna of Colorado we know only three species. In Miocene times it appears that *Heriades* was prolific in species in the Rocky Mountain country, just as it is in South Africa today. Why it has become limited to a few types in modern Colorado we cannot conjecture, unless it may be that suitable nesting places are now less frequently available.

# The Reason why Catocala Eggs are Occasionally Deposited on Plants upon which the Larva cannot Survive; and a New Variation (Lepid., Noctuidae).

By Ernst Schwarz, St. Louis, Missouri.

Twelve years ago Rowley (Entomological News, 1911, Vol. XXIII, p. 207.) collected from hickory a live egg of *Catocala ilia*. The egg hatched, the larva refused to feed on the hickory; but feasted on the burr oak. After mentioning that he had occasionally found on the shagbark hickory, dead eggs and dead larvae of what seemed to be this same species, Rowley inquires "Why are these eggs laid on a tree whose leaves the young larva cannot eat?"

For nearly eleven years the present writer has been investigating that problem. After conducting numerous experiments, all of which yielded the same results, the present writer thinks he has the solution to this problem which has long puzzled the naturalists. These experiments extended over a period of seven years; but, since the results of all experiments are similar, I shall confine my discussion to an experiment performed in 1921.

On August 16, 1921, I captured two females of *C. cara*. Each was placed in a two-pound paper bag and carried home. There each was confined in a large glass globe. In each globe I had previously placed a willow twig, a poplar twig and a hickory twig; willow is the natural food plant of this species.

The night beginning August 17th and ending August 18th both rested quietly on the willow, but no eggs were deposited. On the following night number one laid ten eggs and number two, eleven, all on the willow. The next night number one deposited twenty-one and number two, thirty eggs, all on the willow. Both seemed contented with their surroundings and continued to lay. By September 15, number one laid two eggs on the poplar; on the 16th, one on the poplar and two on the hickory. On the same night number two deposited one on the hickory. On the night of the 17th each rested on the

paper in the bottom of the cage. In the morning both were dead; but each had deposited an egg on the paper.

In previous years similar experiments were conducted with *C. ilia* Cram., a burr oak feeder; *C. titania* Dodge, a cockspur thorn (*Crataegus crus-galli* L.) feeder; and *C. palaeogama* Gn., a walnut feeder. The results were practically the same as that described above.

These experiments seem to permit of but one interpretation. As far as the catocala moths are concerned, ovipositing on other than the food plants of the larva is a function of old age. It is a sign of physical exhaustion. When the senses of sight and of smell have been so dulled by age that the moth has lost the power of discrimination then, and not until then, eggs are deposited on objects other than the food plant of the species. Fortunately for the species, this condition seldom occurs until after the bulk of the eggs have been deposited; hence it is not a handicap to the survival of the species.

### A New Variation

**Catocala hypolita,** Strk. variety **walteri,** new variety.

Ground color light bluish, speckled lightly with black atoms. All markings very contrasting, heavy black, except the subterminal line, which is white. A heavy basal dash extends across the wing, terminating at inner angle between veins 1 and 2, only interrupted by the subterminal line. In all other respects as in the type. Expands 75 mm.

Described from one male and one female collected and reared by Mr. C. Walter. Type locality, Anaheim, California. *Type*, one male in the collection of the author and one female in that of Mr. Walter.

This variant rivals *semirelicta* in beauty.

## The Bacot Memorial Fund.

In memory of Arthur William Bacot, whose death from typhus, while investigating the transmission of the disease by lice, was reported in the News for 1922, page 255, the Bacot Memorial Fund has been started in England to provide assistance to the authorities of the council schools in his home (Loughton) in furthering the study of natural history. (*Nature*, as reported in *Science*, lviii, p. 29).

# A New Species of Agrilus from Kansas (Buprestidae, Coleop.).

By A. B. Champlain and J. N. Knull, Bureau of Plant Industry, Harrisburg, Pennsylvania.

The following species of *Agrilus,* found among some material sent to the writers for identification, through Prof. J. G. Sanders, is believed to be undescribed.

We are indebted to Prof. H. C. Fall for comparing it with the type of *Agrilus townsendi* Fall, and to Mr. C. A. Frost for examination of material.

**Agrilus paramasculinus** new species.

Form and size of *A. masculinus* Horn, dull cupreo-aeneous, each elytron with an indistinct vitta. Antennae reaching to the middle of the prothorax in the male, serrate from the fourth joint, head convex, front slightly strigate, vertex punctate, clypeus extremely broadly emarginate, becoming nearly truncate. Prothorax wider than long, sides strongly arcuate, sinuate near hind angles which are strongly carinate in both sexes, disk convex with two slight median depressions, lateral oblique depressions well marked, surface transversely strigate, densely pubescent laterally. Scutellum granulate, transversely carinate. Elytra dilate behind the middle, sinuate behind the humeri, apices rounded, serrulate, surface granulate-imbricate. Body beneath more shining than above, rather markedly pubescent, prosternal lobe emarginate, pygidium punctate, not carinate, abdomen densely but lightly punctate, tarsal claws deeply cleft, the inner portion turned inward, nearly, or quite touching that of the opposite side. Length 6 mm.

♂. Pro-, meso- and metasternum densely pubescent along median line, fore and middle tibiae mucronate on inner side, hind tibiae not mucronate.

♀. Ventral surface without any marked pubescence along median line, none of the tibiae mucronate.

According to Horn's key* this species would run to *A. masculinus* Horn, but it can easily be distinguished from this species by the faint vittate elytra and the much shorter first joint of hind tarsi.

Described from a series labeled "Kan. T. B. A.," in the Purdue University collection. *Type* in the Purdue University collection. The authors are indebted to Prof. J. J. Davis for the privilege of describing the species.

---

*Horn, G. H.—Trans. Amer. Ent. Soc., V. 18, p. 283—1891.

# Notes on the Family Nemestrinidae (Diptera).

By FRANK M. HULL, Ohio State University, Columbus, Ohio.

The family Nemestrinidae comprises an unique group of flies rarely met with by most collectors and then only in its peculiar habitat—the dry and arid regions of the world. The North American representatives, of which there are now nine species in four genera, have been recorded from Central America, Mexico, western United States and Florida.

**Neorhynchocephalus volaticus** Williston.
Canadian Entomologist, 15, p. 71, 1883.

This species was exceedingly abundant in the vicinity of the Mississippi Agricultural and Mechanical College, during the month of July, 1922. The college is located near Starkville, Mississippi, in the north-eastern part of the state and this locality forms quite an extension of range for the species. It is a section of the state that becomes extremely dry in summer and very few flowers are then present. Pine-covered areas meet there with areas of decidous growth. There are no streams in this immediate region.

The writer found the species while collecting in tall, half-dried field grass. There was also an occasional shrubby bush and considerable half-grown goldenrod (*Solidago*). The flies were poised in the air from about a foot above the tops of the grass, to all depths within it. Apparently they were engaged in threading the mazes of the grass close to the earth. None were observed at rest upon the earth or vegetation. They flew slowly when not alarmed, at every few inches stopping to hover in the air, when they constantly emitted a very high-pitched hum or drone that is quite characteristic. The note appears to possess something of a ventriloquial effect, for the flies were not easy to discern even long after they were heard droning.

At nearly every step flies were flushed and often several might be seen at the same time. If approached too precipitously with the net they darted off very quickly, yet not so fast but that they might be followed with the eye for some sixty or seventy feet, when they apparently descended to earth again. In all, 32 males and 38 females were taken, during the period from July 21 to 29, 1922. A specimen was subsequently taken

by the writer at West Point, Mississippi (20 miles distant,) on Aug. 4, 1922, under similar conditions. Further, an examination of student collections showed three specimens collected a week to ten days before July 21, at Mississippi Agricultural and Mechanical College. In the collection of the college of the fall of 1921, were found three specimens taken in July of that year, one of them on July 7. The earliest record known from the state is of a specimen collected by Prof. R. W. Harned, July 16, 1909, at the college.

The flies were observed upon flowers in only a few instances; once on a small blue flower and twice on flowers of the *Rudbeckia* type. They were most active from two p. m. to four-thirty p. m., after which they became noticeably scarcer. No collecting was done in the forenoon. From the fact that they were quiet at noon and most active in the hottest part of the day, it is probable that they were quiet in the forenoon. They were observed on all sides of the college in situations similar to the one described. The breeding of the flies at the locality may be taken without question.

I have found the species in abundance on two other occasions. At Kingsville, Texas, June 6, 1921, nine specimens were collected from the greenish heads of a flower of the mint family. They were in a creek bed among considerable rank growth of vegetation. Hundreds of the flies were found at Raymondville, Texas, at mid-day (hottest part of the day), of June 29, 1921, over a large area of dense scrubby growth some four to five feet high and interspersed with cacti (*Opuntia*, etc.) and ebony trees in bloom. They were poising before the small greenish white flowers of white-bush (*Aloysia ligustrina* Small). About a dozen were collected.

The majority of the specimens were 10.5 to 11 mm., in length, exclusive of ovipositor (in the female). Three specimens were found to measure 12 to 13 mm., and two, only 9 mm. The ovipositor measured 2.5 mm.

The appearance of the insect is rendered characteristic by a rather thick clothing of a pale yellow, appressed pile, over the whole body, which hides the ground color, but which is generally denuded to some extent upon the abdomen. The ground color of the abdomen is shining light brown, the posterior margins of the segments usually show a

narrow black line, which, as a rule, is produced in the middle and anteriorly to form an uneven, black, median fascia on the dorsum of the abdomen. The pile of the abdomen is most adherent on the posterior margins of the segments producing a characteristic banded appearance.

**Hirmoneura bradleyi** Bequaert.

Journal New York Entomological Society, vol. 27, p. 311.

Three specimens of this species were collected by Mr. R. H. Painter, to whom the writer is indebted for the following notes. They were taken in Bee Creek Canyon, Austin, Texas, on May 19 and June 7, 1921. Bee Creek Canyon is two miles from Austin and in the dry limestone country of Edward's Plateau. Two of them, in copula, were taken at mountain cedar, *Sabina sabinoides* Small, and the third from the pink flowers of *Callicarpa americana* L. They were poising in the air and emitting the characteristic drone of the group. A fourth specimen was taken at Austin, Texas, on May 25, 1922, at mountain cedar.

*H. bradleyi* is characterized by its general dark reddish brown and smoky coloration and its longitudinally striped thorax.

## Additional Syrphidae (Diptera) from North Carolina, with Descriptions of Two Supposed New Species.

By C. S. Brimley, Division of Entomology, N. C. Dept. of Agriculture, Raleigh, North Carolina.

This list is supplementary to the one published by C. L. Metcalf, in the Elisha Mitchell Journal, Chapel Hill, N. C., December, 1916, in which he enumerates 128 species from this state, this list of fifteen more bringing the total number of Syrphidae known from the state to 143.

Pipiza festiva Meigen, Raleigh, March 21, 1921, April 7, 1923 CSB.

Pipiza nigripilosa Will., Raleigh, August 2, 1921, CSB.

Chrysogaster inflatifrons Shannon, Four males, N. C., Morrison (Shannon, Proc. Ent. Soc. Wash, XVIII, 107.)

Chilosia similis Shannon, Raleigh, September 30, October 7, 1921, CSB.

Syrphus knabi Shannon, Raleigh, March 28, 1908, August 5, 1918, late June, Black Mts., late May, 1910, F. Sherman and CSB.

Xanthogramma flavipes Loew, Raleigh, September 13, 1922, one, CSB.

Brachyopa vacua O. S., Raleigh, April 7, 1923, one on blossoms of black haw (*Viburnum prunifolium*). In this connection I may state that

I took 23 species of Syrphidae on the flowers of this shrub in four days' collecting this spring.

VOLUCELLA EVECTA Walker. Linville Falls, early June, 1920, one, FS.

ERISTALIS LATIFRONS Loew. Fayetteville, early June, 1921, one, CSB.

**Helophilus anniae** n. sp.

Face, antennae, arista, and lower part of front light yellow, the latter with yellow pile, narrower portion of front (between the eyes above) dark brown with dark pile. Thorax with two narrow submedian yellow stripes, and a somewhat broader one on each side, scutellum paler than thorax. Legs: front and middle femora dark brown for about basal two-thirds, yellow at apex, front and middle tibiae and tarsi mainly yellow, hind femora yellow on basal third, then abruptly black to apex, hind tibiae and tarsi black. Abdomen: second, third and fourth segments each with a pair of yellow spots, these wider externally and narrower internally, those of each pair widely separated, those of second and fourth segments broadly reaching the sides of those segments, those of third segment nearly or quite separated from the side of the segment by the ground color, a small yellow spot on the apex of fourth segment. Length about 11 mm.

One male taken at Raleigh, North Carolina, resting on foliage (bushes) near edge of small woodland stream, April 20, 1921 (*type*), and another male taken near the same place, May 9, 1921, both by myself. Type deposited in the United States National Museum, the paratype in the collection of the N. C. Dept. of Agric.

A female taken at Aberdeen, North Carolina, May 10, 1922, by R. W. Leiby appears to be the same species, the only differences being that it is slightly larger, the submedian stripes on the thorax are a trifle wider, there is no apical yellow spot on the fourth segment, and the pile on the front above the antennae is largely black, instead of yellow.

This species looks somewhat like a small *H. similis*, but differs from all species I know or could find descriptions of, in the following combination of characters,—wholly yellow face, antennae, and arista; three pairs of widely separated yellow spots on abdomen, and in the hind femora being yellow at base, and black in middle and apex. (Named for Mrs. C. S. (Annie) Brimley.)

TROPIDIA MAMMILLATA Loew, Raleigh, June 13, 1922, T. B. Mitchell.

**Somula marivirginiae** n. sp.

Resembles *S. decora* in general habitus, but differs in having the antennal prominence longer and more slender, in the possession of a

black facial stripe, and in the spots on the abdomen being smaller and transverse; the abdomen is not edged with yellow. Sexes practically alike in color.

Length about 16 mm. Antennal prominence slender, conical, about three times as long as its width at apex as seen from above (about twice as long, in *decora*), much less widened at base as seen from side so that the facial concavity is considerably higher up. Second antennal joint longer than in *decora*.

Coloration much as in *decora*, but differing as follows: the black on the dorsal surface of the antennal prominence is not almost or entirely surrounded by yellow at the base as in *decora*, but extends backward in undiminished width. On the underside of the prominence a narrow black stripe extends downward the whole length of the face to the oral opening; face yellow and cheeks black as in *decora*.

Arista concolorous with antennae, not much paler as in *decora*.

Thorax and scutellum about as in *decora*, with the same yellow humeri, but the patch of yellow hair on the mesopleurae is darker and less contrasting. Femora, tibiae, and metatarsi mainly yellow as in *decora*, except that the male has the middle portion of the hind femora dark brown; other portions of legs blackish or dusky.

Second, third and fourth dorsal abdominal segments each with a pair of yellow spots, these transverse and not oblique as in *decora*, somewhat smaller than in that species, all of them straight edged in front: fifth segment immaculate in both sexes. Abdomen not yellow-edged, the ground color extending to the sides. Venter blackish, the segments edged with yellow behind but not on the sides. The pile of the body about as in *decora*.

*Type*, a male collected at Raleigh, North Carolina, on blossoms of black haw, growing close to Walnut Creek, near where it enters Neuse River; *paratype*, female taken at same date and place. (Named for Mary-Virginia Dunn, my favorite niece.) Type deposited in National Museum, paratype in collection of N. C. Dept. of Agriculture.

CYNORHINA INTERSISTENS Walker, Linville Falls, early June, 1920 FS.
TEMNOSTOMA EXCENTRICUM Harris, Raleigh, May 8, 1922, CSB.
MICRODON AURULENTUS Fab., Raleigh, May 9, 1922, one, CSB.
MICRODON BOMBIFORMIS, Twnd, Raleigh, May 18, 1918, CSB.

## Prof. and Mrs. T. D. A. Cockerell Escape from the Japanese Earthquake.

It is a matter of rejoicing among entomologists to learn that Professor and Mrs. T. D. A. Cockerell escaped from the Japanese earthquake. In *The Outlook* for October 3, 1923, Professor Cockerell relates his observations of the scene in Yokohama, as witnessed from the steamship *Empress of Australia* in that harbor.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., NOVEMBER, 1923.

### Give!

Elsewhere in this number of the NEWS, will be found an announcement of important gifts to the Division of Insects of the United States National Museum. During the present year reference has been made in these pages to various donations to museums on the other side of the Atlantic. It is especially gratifying to be able to record an equal instance of munificence in these United States. While there are exceptions to the statement that the great endowed or state-supported museums are the best resting places for private collections, the statement *is* generally true and we hope that many more American entomologists will follow Dr. Aldrich's example and in their life-time place their treasures where the latter may be freely accessible to their fellow-workers.

## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### Two European Weevils established in North America (Coleoptera: Curculionidae).

**Notaris bimaculatus** Fabr. (wyomingensis Chittenden)

At the suggestion of Dr. Schwarz, the writer obtained a good series of the European *N. bimaculatus* for comparison with Chittenden's species. The two proved to be identical, and Dr. Chittenden who later studied the European set also pronounces his species a synonym. In addition to the type locality of *wyomingensis* (Cheyenne, Wyoming) the beetle has been found at Ft. Resolution, Mackenzie; Lone Deer, Montana; Volga, South Dakota; Spirit Lake and Lake Okoboji, Iowa; Madeline Island and Madison, Wisconsin.

The fact that nearly all the earlier records are from the west, while the later records become progressively more eastern, may indicate a west to east movement of dispersal, though nothing more than a surmise can be based on the scanty evidence now available.

**Phytonomus rumicis** Linn.

This species which is recorded as common on *Rumex and Polygonum amphibium* in Europe, was found in considerable numbers on a patch of *Polygonum* near Iowa City, Iowa, in May, 1917. Mr. F. S. Carr has also collected it at Edmonton, Alberta, (1919), and Mr. Sperry found one specimen in the stomach of an upland plover collected at Gronna, North Dakota, May 25, 1912. Dr. A Fleischer thinks it may

represent an American variety of *rumicis* on account of the somewhat brighter markings, but a separate name seems unnecessary. The better marked individuals of *rumicis* can be identified by the heavy black stripe on the elytra extending from the base backward along the suture and meeting a large transverse black spot or bar before the middle. Behind this bar the scales are whitish or at least distinctly brighter than the general surface color. The black markings are sometimes only vaguely indicated or even absent, but the patch of brighter colored scales behind the middle is present on all the specimens examined, and is apparently a distinctive feature. In the structure of the beak, antennae, and scales *rumicis* closely resembles *eximius* Lec., but the latter has the sides of the thorax more strongly arcuate and the body more convex.

Poorly marked individuals of *rumicis* might easily pass for *eximius*, and it is possible the two will be found mixed in collections.

L. L. BUCHANAN, U. S. Biological Survey, Washington, D. C.

---

**The New Director of the Pennsylvania Bureau of Plant Industry.**

Charles H. Hadley, recently named by Secretary of Agriculture Frank P. Willits as the new director of the Pennsylvania Bureau of Plant Industry, took immediate charge of the work of the bureau on the day of his appointment, July 23, 1923.

Director Hadley is probably most widely known to agriculturists in Pennsylvania and in other parts of the country through his endeavors during the past three years as the federal entomologist in charge of all field operations of the joint Japanese Beetle project in south-eastern Pennsylvania and in New Jersey. Entering the federal service in April, 1919, as a plant quarantine inspector at the Riverton, N. J., laboratory, later put in charge of the control work with 25 to 30 men under his direction and, in October, 1920, placed in complete charge of the project, his record of achievement in entomological work has been notable.

His early education was obtained in the Manual Training High School and the Polytechnic Preparatory School in Brooklyn, N. Y. In the fall of 1908, he entered Yale University and two years later transferred to the New Hampshire College of Agriculture and Mechanic Arts, receiving the degree of bachelor of science in 1912.

While a student at the New Hampshire state college he assisted in the insectary and laboratory and also engaged in experimental work in the field. For three years after graduation he held an assistantship in entomology in the college experiment station and in 1915 he went to Cornell University to pursue a year of study in advanced entomological subjects.

He is a member of the American Association for the Advancement of Science and has been a member of the American Association of Economic Entomologists since 1912. Other affiliations include Alpha Zeta, honorary agricultural society, and Sigma Xi, honorary scientific society. Among his most recent publications are: "The Japanese Beetle" (New Jersey Station circular), and "The Clover Leaf Weevil" (Cornell

Experiment Station bulletin). Other scientific contributions include, "The Lesser Migratory Locust" (Cornell); "Potato Insects" (Pennsylvania); "Arsenical Residues" (New Hampshire); "The Rhododendron Lace Bug," "The 17-Year Locust in New York," and "The Japanese Beetle Quarantine," in various issues of the *Journal of Economic Entomology*.

It is encouraging to those interested in the successful culmination of the Jap beetle fight that an agreement has been made between the Pennsylvania and the United States governments whereby Director Hadley will continue to oversee the general operations of the co-operative project during the next few months, while also giving his attention to the new duties in Pennsylvania. Part of his time will be given to the federal work in which he has been engaged and part to the duties of the Pennsylvania directorship. In his absence on federal duty, general supervision of the State work will be vested in Deputy Director Walter A. McCubbin.

---

**A Magnificent Gift to the National Museum (Diptera).**

The National Museum has recently received as a gift from Dr. J. M. Aldrich his private collection of Diptera. This collection was begun in 1890, and for 28 years received a good share of the owner's efforts; since he went to the National Museum in 1918 it has however received no additions. A recent inventory showed it to contain 44,610 pinned specimens and 4,145 species fully named; 534 of the latter were represented by type material. There are some hundreds of undescribed species; and as Dr. Aldrich collected for many years in the Pacific Coast and Rocky Mountain regions, his collection contains many named species not heretofore represented in the National collection.

Dr. Aldrich also donated to the Museum his card index of the literature of North American Diptera, begun in 1898 and now extending to about 70,000 references as nearly as can be estimated. With the exception of about 20 hours' work, this is all by the hand of the owner himself, and represents to a large extent his own conclusions from the literature rather than a mere compilation.

In a letter to his chief presenting the collection and index, Dr. Aldrich states that he was deterred from taking this action sooner because the salaries paid by the Museum are still on the scale established in 1882 (except for a temporary war bonus of $240), and he did not feel sure that he could continue permanently as one of the curators. Recently, however, under the reclassification act passed by the last Congress, the Museum staff have been assured of a new pay schedule approximating the requirements of the present time.

## A Note on the Relationships of Pyrgotidae (Diptera).

Wiedemann, when he described the genus *Pyrgota,* placed it between the genera *Tetanocera* and *Platycephala.* In Williston's Manual and Aldrich's Catalogue it is placed in the family Ortalidae, but recently Hendel, Frey, and others have elevated it to family rank, the group now containing several other genera. There is a very evident difference of opinion amongst authors as to the relationships of the group. Hendel separates it widely from Conopidae while Frey associates it more closely with that family though indicating no definite relationship with it. It is my opinion that the families Conopidae and Pyrgotidae are more closely related than is evident from a survey of existing classifications and that they ought to be more closely associated in our lists, though to what other families they are both most closely related it is difficult to decide. The families, so far as we know, are parasitic in their larval stages, Conopidae in Hymenoptera, Pyrgotidae in Coleoptera and, in addition to this affinity of habit, in both families the ocelli are frequently absent or vestigial, which is nearly unique in related forms, and the mid coxae lack the chitinized prong on their upper outer side. This last character separates the families from nearly all those in Cyclorrhapha and sets the Pyrgotidae entirely apart from Ortalidae, all of which have the process very well developed.—J. R. MALLOCH, U. S. Biological Survey, Washington, D. C.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A. London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of The American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **6**—Journal of The New York Entomological Society. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic

Entomology, Concord, N. H. **20**—Bulletin de la Societe Entomolgique de France, Paris. **21**—The Entomologist's Record, London. **22**—Bulletin of Entomological Research, London. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **34**—Bulletin de la Societe Entomologique de Belgique, Brussels. **35**—Proceedings of the South London Entomological & Natural History Society, London. **36**—Transactions of the Entomological Society of London. **37**—Proceedings of the Hawaiian Entomological Society. **39**—The Florida Entomologist, Gainesville, Florida. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **52**—Zoologischer Anzeiger, Leipzig. **59**—Journal of Agricultural Research, Washington, D. C. **61**—Proceedings of the California Academy of Sciences, San Francisco. **67**—Le Naturaliste Canadien, Quebec. **68**—Science, Garrison on the Hudson, N. Y. **78**—Bulletin Biologique de la France et de la Belgique, Paris. **82**—The Ohio Journal of Science, Columbus, Ohio. **85**—The Journal of Experimental Zoology, Philadelphia. **89**—Zoologische Jahrbucher, Jena. **91**—The Scientific Monthly, Lancaster, Pa. **99**—Bulletin du Museum National d'Histoire Naturelle, Paris. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **103**—Biologisches Centralblatt, Leipzig. **114**—Entomologische Runschau, Stuttgart. **115**—Societas Entomologica, Stuttgart. **116**—Entomologische Zeitschrift, Frankfurt a. M. **138**—American Museum Novitates, New York. **139**—Bulletin of the Southern California Academy of Sciences, Los Angeles. **149**—Deutche Entomologische Zeitschrift "Iris," Dresden.

**GENERAL. Biener, A.**—Die kriegsgefangenschaft vom standpunkte des entomologen. **116** xxxvii, 17-18. **Brues, C. T.**—Ancient insects; fossils in amber and other deposits. **91,** xvii, 289-304. **Bunnet, E. J.**—Some notes on the natural history of Manitoba. **35,** 1922, 76-89. **Chapais, J. C.**—Insectes a respecter. **67,** 1, 25-30. **Crampton, G. C.**—A phylogenetic comparison of the maxillae throughout the orders of insects. **6,** xxxi, 77-107. **Ferris, G. F.**—Entomological illustrations. **68,** lviii, 265-66. **Fremlin, H. S.**—The growing importance of entomology. **21,** xxxv, 136-39. **Hartley, E. A.**—A useful cage for the rearing of small insects on growing plants. **82,** xxiii, 201-3. **Illingworth, J. F.**—Insect fauna of hen manure. **37,** v, 270-74. **Lameere, A.**—On the wing-venation of insects. **5,** xxx, 123-32. **Monchaux, D. de**—Sur l'insuffisance relative de certains moyens de protection des insectes; a propos d'une note d A. Chappellier sur le regime alimentaire des Corbeaux Freux. **20,** 1923, 148-9. **Prell, H.**—Uber eine "fremddienliche zweckmassigkeit" bei insekten und ihre kausale analyse. **103,** xliii, 432-9. **Thompson, W. R.**—A criticism of the "sequence" theory of parasitic control. **7,** xvi, 115-28.

**Williams, C. B.**—Records and problems of insect migration. **36,** 1923, 207-33.

**ANATOMY, PHYSIOLOGY, ETC.—Bridges & Morgan**—The third-chromosome group of mutant characters of Drosophila melanogaster. (Carnegie Inst. Wash., Pub. No. 327, 251 pp.) **Metz, Moses, & Mason**—Genetic studies on Drosophila virilis with considerations on the genetics of other species of Drosophila. (Carnegie Inst. Wash. Pub. No. 238, 94 pp.)

**ARACHNIDA AND MYRIOPODA.—Provancher**—Les merveilles de la creation dans les choses les moins remarques. **67,** 1, 9-18. **Simon, E.**—Note sur la synonymie et la distribution de deux especes d'araignees exotiques. **99,** 1923, 221. **Valadez, S. M.**—Ensayo de una monografia sobre ixodidos mexicanos vulgo garrapatas. (Mem. Soc. "Alzate," xli, 197-216.) **Webster, R. L.**—Scorpions in North Dakota. **68,** lviii, 248. **Weiss, S.**—Untersuchungen uber die lunge und die atmung der Spinnen. **89,** xxxix, Allg. u Zool. 535-44.
**Chamberlin, R. V.**—New and little known pseudoscorpions, principally from the islands and adjacent shores of the Gulf of California. On chilopods and diplopods from the islands in the Gulf of California. A revision of the genus Anisembia, with description of a n. sp. from the Gulf of California. **61,** xii, 341-51; 353-87; 389-407.

**THE SMALLER ORDERS OF INSECTA. Brethes, J.**—Un Dorypteryx nouveau de Buenos-Ayres. **20,** 1923, 117-18. **Lestage, J. A.**—La persistance des tracheo-branches larvaires chez les Perlides adultes. **34,** v, 63-78. **Lucas, W. J.**—Labium (second maxillae) of the Paraneuroptera (Odonata). **35,** 1922, 57-63. **Muir, F.**—(See under Diptera.) **Smith, R. C.**—The life histories and stages of some Hemerobiids and allied species. **7,** xvi, 129-42. **Waterson, J.**—On the Mallophaga of the Shackelton-Rowett expedition, 1921-1922. **36,** 1923, 288-90. **Watson, J. R.**—The proper name and distribution of the Florida flower thrips. **39,** vii, 9-11.

**Dodds, G. S.**—Mayflies from Colorado. Descriptions of certain species and notes on others. **2,** xlix, 93-114.

**ORTHOPTERA. Buddenbrock u. Rohr.**—Die atmung von Dixippus morosus. (Zeit. f. Allgem. Phys., xx, 111-60.) **Uvarov, B. P.**—Notes on locusts of economic importance, with some new data on the periodicity of locust invasion. **22,** xiv, 31-39.

**Hebard, M.**—The Dermaptera and Orthoptera of the Gulf of California expedition. **61,** xi, 319-40.

**HEMIPTERA. Barber, G. W.**—Notes on a New England aradid. **5,** xxx, 120-22. **Bergoth, E.**—On the systematic position of the genera Dismegistus and Parastrachia. **33,** lxiii, 70-72. **Brain, C. K.** —A preliminary report of the intracellular symbionts of South

African Coccidae. (Ann. Univ. Stellenbosch, i, Sec. A, No. 11, 48 pp.) **Britton, W. E.**—Swarms of aphids. **12**, xvi, 395. **Funkhouser, W. D.**—Walker's species of Membracidae from U. S. and Canada. **7**, xvi, 97-114. **Garman, P.**—Notes on the life history of Clastoptera obtusa and Lepyronia quadrangularis. **7**, xvi, 153-64. **Hargitt, C. W.**—The digestive system of the periodical cicada. II. Physiology of the adult insect. **100**, xlv, 200-12. **Hickernell, L. M.**—The digestive system of the periodical cicada, Tibicen septendecim. III. Morphology of the system in the nymph. **100**, xlv, 213-21. **Mason, A. C.**—Is the adult condition of an aphid determined when it is born? **39**, vii, 1-7. **Muir, F.**—On the classification of the Fulgoroidea. **37**, v, 205-48.

**Fracker, S. B.**—A review of the N. Am. Coreini. **7**, xvi, 165-75.

**LEPIDOPTERA. Adkin, R.**—The lepidopterous enemies of Man. With special reference to species that occur in Britain. **35**, 1922, 26-47. **Ainslie, G. G.**—Striped sod webworm, Crambus mutabilis. (Jour. Agr. Res., Wash., xxiv, 399-414.) **Bang-Haas, O.**—Die typen der gattung Agrotis der collection Staudinger u. Bang-Haas in Dresden-Blasewitz. **149**, xxxvi 31-9. **Barnes & Benjamin.**—Notes on the authorship of certain names (Phalaenidae.) **4**, lv, 198. **Butler, A. G.**—Melanism in lepidoptera. **9**, 1923, 187-88. **Butler & Sevastopulo.**—Variation in lepidoptera. **9**, 1923, 215-6. **Comstock, J. A.**—Studies in Pacific coast L. Butterflies of California. **139**, 69; 75. **Goldschmidt u. Pariser.**—Triploide intersexe bei schmetterlingen. **103**, xliii, 446-52. **Grosvenor, T. H. L.**—Notes on the genus Zygaena. **35**. 1922, 64-72. **Huggins, H. C.**—Variation in lepidoptera. .**9**, 1923, 188-90. **Krueger, E.**—Kurze ubersicht uber die Morphiden Columbiens. **114**, xl, 31-2. **Lathy, P. I.**—Further notes on the Castniinae in the collection of Madame Gaston Fournier. **11**, xii, 223-7. **Lindsey, A. W.**—The egg and larva of Hesperia juba. (Dennison Univ. Bull., xx, 121-26.) **McDunnough, J.**—Extended pupal duration. **4**, lv, 198. **Moreau, E.**—Un Papilio nouveau de la Guyane francaise. **20**, 1923, 144. **Pittioni, B.**—Noctuidenfang an "naturlichen" koder. **116**, xxvii, 21-2. **Skinner & Williams**—On the male genitalia of the Hesperidae of N. Am. III. **2**, xlix, 129-53. **Stirling, F.**—Southern migration of butterflies. **39**, vii, 8-9. **Turati, E.**—Cinque anni di ricerche nell 'appennino modenese. (Note di lepidopterologia). (Atti Soc. Ital. Sc. Nat., Milano, lviii, 4-74.) **Tillyard, R. J.**—On the mouth parts of the Micropterygoidea. **36**, 1923, 181-206. **Watkins, H. T. G.**—Notes on the butterflies of the Banks collection. **9**, 1923, 204-9. **Wynne, A. S.**—Melanism in lepidoptera. **9**, 1923, 216.

**Barnes & Benjamin**—Noctuidae of the Gulf of California expedition. **61**, xii, 423-24. **Braun, A. F.**—Microlepidoptera: notes and n. sps. **2**, xlix, 115-27.

**DIPTERA. Harris, R. G.**—Occurrence, life-cycle, and maintenance, under artificial conditions of Miastor. **5,** xxx, 95-101. **Herve-Bazin, J.**—Note synonymiques sur quelques Lathyrophthalmus. **99,** 1923, 173-4. **Kreisel, C.**—Untersuchungen uber den einfluss von sauerstoff, kohlensaure und neutralsalzen auf Culicidenlarven und puppen. **89,** xxxix, Allg. u. Zool., 459-534. **Mast, S. O.**—Photic orientation in insects with special reference to the drone fly, Eristalis tenax and the robber-fly, Erax rufibarbis. **85,** xxxviii, 109-205. **Muir, F.**—On the homology between the genitalia of some diptera and those of Merope tuber. **36,** 1923, 176-80. **Rabaud, E.**—Sur le comportement de Scatophaga stercoraria. **20,** 1923, 167-8. **Seguy, E.**—Etude sur le Muscina stabulans. **99,** 1923, 310-17. **Simmons, P.**—A house fly plague in the American Expeditionary Force, France. **12,** xvi, 357-63. **Surcouf, J.**—Deuxieme note sur les conditions biologiques du Stomoxys calcitrans. **99,** 1923, 168-72. **Thompson, W. R.**—Recherches sur la biologie des dipteres parasites. **78,** lvii, 174-237.

**Curran, C. H.**—Undescribed Canadian Dolichopodidae, with key to Chrysotimus. Change of name. **4,** lv, 190-92; 198. **Curran, C. H.**—Two undescribed syrphid flies from New England. (Occ. Pap. Boston Soc. N. H., v, 65-7.) **Hine, J. S.**—Alaskan species of D. of the genus Helophilus, with notes on others. Some notes on American Tabanidae, with the description of a n. sp. from Africa. **82,** xxiii, 192-200; 204-6. **Malloch, J. R.**—Anthomyiidae and Lonchaeidae from the Gulf of California expedition. **61,** xii, 425-28. **Melander, A. L.**—The genus Cyrtopogon (Asilidae). **5,** xxx, 102-119.

**COLEOPTERA. Aurivillius, C.**—Coleopterorum catalogus. Pars 74: Cerambycidae: Lamiinae II. 323-704. **Carr, F. S.**—Additions to the list of the C. of Northern Alberta. **4,** lv, 196-7. **Chittenden, F. H.**—The Australian tomato weevil introduced in the south. (U. S. Dept. Agr., Dept. Circ. 282.) **Davidson, W. M.**—Biology of Scymnus nubes. **2,** xlix, 155-63. **Desbordes, H.**—Description d'un Saprinus nouveau du Brasil. **20,** 1923, 151-2. **d'Orchymont, A.**—Les Hydraena Americaines. **33,** lxiii, 33-44. **Portevin, M. G.**—Revision des Necrophorini du globe. **99,** 1923, 64-71, (cont.) **Schmidt, A.**—Das tierreich. Lief. 45. Coleoptera: Aphodiinae. 614 pp. **Sloane, T. G.**—The classification of the family Carabidae. **36,** 1923, 234-50. **Stichel, W.**—Zur phylogenesis eines geologische jungen formenkreises der kaefer, der Ditominen. **45,** xviii, 145-62 (cont.) **Stickney, F. S.**—The head-capsule of coleoptera. (Ill. Biol. Mon., viii, No. 1.)

**Blaisdell, F. E.**—The Melyridae of the Gulf of California expedition. **61,** xii, 409-21. **Nicolay & Weiss.**—The group Traches in N. Am. Pt. II. The genus Brachys, **6,** xxxi, 59-76.

**HYMENOPTERA. Cockerell, T. D. A.**—Descriptions and records of bees. XCVIII. **11,** xii, 238-47. **Forel, A.**—Le monde social

des fourmis. V. Moeurs specialisees. Epilogue: les fourmis, les termites et l'homme. 173 pp. 1923. **Heikertinger, F.**—Zur metoken myrmekoidie. **45**, xviii, 163-78. **Hill, C. C.**—Platygaster vernalis, an important parasite of the hessian fly. **59**, xxv, 31-42. **Howes, P. G.**—Life and habits of the common mud wasp (Sceliphron). (Nature Mag., ii, 197-200.) **Lichtenstein et Rabaud**—Le comportement des "polysphincta" ichneumonides parasites des araignees. (Trav. Inst. Zool. Univ. Montpellier, (2), Mem. 38.) **Santschi, F.**—Pheidole et quelques autres fourmis neotropiques. **33**, lxiii, 45-69. **Schnelle, H.**—Uber den feineren bau des fettkorpers der honigbiene. **52**, lvii, 172-79. **Semichon, L.**—Sur les differences specifiques dans les stigmates des larves de Vespa. **20**, 1923, 170-1. **Stager, R.**—Gibt es insekten, die von ameisen nicht verzehrt werden? **115**, xxxviii, 33-5.

**Bradley & Bequaert**—A new Dasymutilla from Arizona. **138**, No. 82. **Fox, C. L.**—The Bembicinae from the expedition to the Gulf of California. **61**, xii, 429-36. **MacGillivray, A. D.**—Quarter century of species of Tenthredo. **6**, xxxi, 107-16. **Sandhouse, G.**—The bee genus Dialictus. **4**, lv, 193-95. **Waterston, J.**—Notes on parasitic H. **22**, xiv, 103-9.

## SPECIAL NOTICES.

**Bulletin of the Lloyd Library,** Cincinnati, Ohio. Entomological Series. The third bulletin of this series has recently appeared, and treats of the morphology, anatomy, and embryology of Nemoura (Plecoptera). The three bulletins contain over 250 pages and many illustrations. No. 1 was on the Biology of North American caddis-fly larvae; 2, treated of the biology of some of our North American species of May flies. **Manual of Entomology** by H. Maxwell Lefroy. Ed. Arnold & Co., London. 541 pp., ill., 1923. A copy of this work has just been received. A review of the same was published in the Entomologist, 1923, p. 190. **Polskie Pismo Entomologiczne.** Bulletin entomologique de la Pologne, Lwow (Lemberg). The first number of this new publication has been received, thus announcing another new European entomological society, and adding another member to the entomological bibliographical community. This number contains 24 pages, eight articles, pertaining to the palaeartic entomological fauna, mostly of Poland. **Fabre, J. H., The Life of the Scorpion.** Translated from the French series of Souvenirs Entomologiques, and completes the translation into English of this series. Published by Dodd, Mead & Co., New York, 1923, 344 pp.

The reader will find this book of exceptional interest. Fabre here tells of much that is not generally known about the life and habits of these intolerated animals in his usual entertaining manner. $2.50.

Dr. CHARLES HENRY TURNER.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXIV DECEMBER, 1923 No. 10

CONTENTS



## Dr. Charles Henry Turner.

(Portrait, Plate VI.)

Charles Henry Turner, Ph. D., Professor of Biology at Sumner Teachers College, Saint Louis, died at Chicago, February 14, 1923.

Dr. Turner was born at Cincinnati, Ohio, on February 3, 1867. From the University of Ohio he received the degrees of B. S. and M. S. in 1891 and 1892. The University of Chicago, in 1907, conferred upon him the degree of Doctor of Philosophy, *magna cum laude.*

While Dr. Turner left the imprint of a valuable teacher in the institutions where he held various teaching positions, the Chair of Biology, Clark University, Georgia, 1892 to 1905, Principal of High School, Cleveland, Tennessee, 1905-1906, Chair of Biology, Haynes Normal School, 1907-1908, Professor of Biology and Psychology, Sumner Teachers College, 1908

until his death, yet he is best known among scientists for his researches in the behavior and comparative psychology of invertebrates.

During his lifetime, Dr. Turner published fifty treatises on neurology, invertebrate ecology and animal behavior. In addition to these, he wrote, for a number of years reviews of the literature on comparative psychology in *The Psychological Bulletin* and in *The Journal of Animal Behavior.* His first work, on the Mushroom Bodies in the Brain of the Crayfish, was published in 1892. A few years later, jointly with Herrick, he published the 500-page treatise on the Entomostraca of Minnesota. Then, suddenly, his attention was turned from the microtome, and he produced a most interesting series of experimental investigations on the behavior of insects. His researches on the homing, on reactions to light, on death feigning, on tropisms, have cleared up some of the most perplexing problems of comparative psychology, and have thrown new light upon the subjects of the interrelations of tropisms, instincts, and what to a certain extent may be called intelligence in the insect world.

But most interesting of all was his technique of experimenting. Dr. Turner spent much thought on his method of work before he ever went into the field, and there with ingenious devices, some simple, some intricate, he solved some of the big problems of insect behavior. The following titles will convey an idea of the variety and resourcefulness of his work: "The homing of ants," "Psychological notes on the gallery-spider," "Do ants form practical judgments?", "The homing of the mud-dauber," "The homing of the burrowing bees," "The mound of *Pogonomyrmex badius* and its relation to the breeding habits of the species," "Experiments on the color vision of the honey-bee," "An experimental investigation of an apparent reversal of the responses to light of the roach," "Experiments on the pattern vision of the honey-bee," "Notes on the behavior of a parasitic bee," "An orphan colony of *Polistes pallipes,*" "Reactions of the mason wasp to light," "*Sphex* overcoming obstacles," "Behavior of the common roach on an open maze," "Auditory powers of the Catocala moths,"

"An experimental study of the auditory powers of the giant silkworm moths," "Notes on the behavior of the ant-lion, with emphasis on the feeding activities and letisimulation," "The mating of *Lasius niger*," "Notes on the feeding behavior and oviposition of a captive false spider," "The locomotion of surface feeding caterpillars are not tropisms," "A week with a mining Eumenid." A complete bibliography of the fifty titles of Dr. Turner's papers is in course of publication by the Academy of Science of St. Louis.

Among Dr. Turner's notes were three completed papers of a less technical nature, which will be published by the same academy. The titles are: "The tropism theory; a protest," "The homing of Hymenoptera," and "The psychology of playing possum." A masterly work, completed during his last illness, entitled "The hydrotropism of marine invertebrates," was accepted for publication, a few days before his death, by the *Biological Bulletin.*

Dr. Turner's works have been very favorably quoted both here in America and in Europe. Dozens of quotations from his treatises are to be found in such works as Wheeler's "Ants," Washburn's "The Animal Mind," Smith's "Mind in Animals," Holmes' "Evolution of Animal Intelligence," and Bouvier's "The Psychic Life of Insects." In fact, in the behavior literature of France, they have named a certain type of orientation after the discoverer. This is best described in Bouvier's book, "The Psychic Life of Insects," translated from the French by Dr. L. O. Howard, where it is "called 'Turner's circling,' using the name of the learned American who best studied this phenomenon."

Dr. Turner's interests were not solely scientific. Often his time and strength were severely taxed by his faithful devotion to various sociological works among his people. Among his unfinished papers were found several chapters of a novel, a number of chapters of a book of nature stories for children, and the manuscript of a book of thirty-two poems. Not alone has science lost one of its most thorough students, but also the colored race has lost one of its most efficient workers for race betterment, in its various and intricate phases.

The handicaps under which Dr. Turner's work was accomplished were many, and were modestly and bravely met. Only one of these was the limitations of a small salary, out of which he was compelled to purchase his own tools and library for research, since he did not enjoy the access to laboratories and institutions where equipment is supplied.

And when at last one considers the quantity and quality of his scientific research work, accomplished under handicaps, and in addition to a full life of other activities and unusual efficiency in the classroom, one can only say—well done!

PHIL RAU.

## The Lower Permian Insects of Kansas. Preliminary Announcement.

By R. J. TILLYARD, Sc. D.
Chief of the Biological Department, Cawthron Institute.
Nelson, New Zealand.

[Studies aided by a grant from the Marsh Fund of the National Academy of Sciences.]

The Yale University Expedition to the Lower Permian insect beds in Kansas, originally suggested by me to Professor Charles Schuchert, organized by him, and carried out by Dr. Carl O. Dunbar in the summer of 1921, brought back about 2000 specimens of fossil insects, many of them in a remarkably fine state of preservation. This locality was discovered by Dr. E. H. Sellards in 1902 and his publications relating to them are given below.* The Yale Collection has recently been received by me in Nelson for description, and the preliminary study and sorting of the immense mass of material is now completed. Owing to the remarkable interest of these fine fossils, a short summary of results is here given, with Professor Schuchert's permission, in order that entomologists may have some general idea of the composition of the insect fauna of that period, and some indication of certain problems in evolu-

*E. H. Sellards, Discovery of Fossil Insects in the Permian of Kansas. Amer. Jour. Sci., vol. 16, 1903, pp. 323-324. Types of Permian Insects. Ibidem, pt. I, vol. 22, 1906, pp. 249-258; pt. II, vol. 23, 1907, pp. 345-355; pt. III, vol. 27, 1909, pp. 151-173.

tion which the new material goes a long way toward solving. The actual series of papers in which the fossils are being described will appear from time to time in the *American Journal of Science,* published at New Haven, Connecticut.

The beds are probably unique in the very large number of individuals of certain species which occur there. The 2000 odd specimens appear to represent well under 100 actual forms. By far the most abundant order in actual specimens, and probably also in species, is the Order Protorthoptera; but these are nearly all greatly reduced types, and a closer study may indicate clear lines of ordinal division amongst them. Of undoubted Protorthopterous origin are certain types which closely resemble the recent Perlaria, Embioptera, Raphidiodea and Sialoidea. There are also some very small wings which appear to have rather close affinity with the Sternorrhynchous Homoptera, and at the same time do not stand far from some of the reduced types of Protorthoptera.

Several fine impressions occur of what appeared at first sight to be undoubtedly a true Beetle, with the body, elytra and hindwings complete. A careful study of this form reveals the presence of short cerci, while the elytra have a very clear venation of Orthopteroid type. In order to elucidate the problem further, I made an enlarged drawing, and then creased it along the concave veins; the model so made shuts up like an earwig's wing, but without the transverse infolding of the apical portion. There can be little doubt, then, that this beetle-like form is really one of the ancestors of our modern Dermaptera, and requires a new Order for its reception. This Order I propose to call *Protodermaptera.*

Cockroaches are, of course, present, but not at all numerous. The only true Holometabola, which can be recognized undoubtedly as such, are a number of very small wings, averaging 5 mm. long, belonging to the Order Mecoptera, and almost exactly similar, apart from their much smaller size, to the existing Australian Choristidae and the extinct Permochoristidae.

Of very great interest are the Palaeodictyoptera, of which one fine species is present, exceedingly closely allied to certain forms found in the Upper Carboniferous of Europe. Of one

of these a description and photographs have been prepared for insertion in Dr. Dunbar's introductory study of the fossil beds soon to appear in the *American Journal of Science*. It is one of the most perfect fossil insects ever discovered; practically the whole body is preserved, with the long cerci showing clearly their close annulation and rings of hairs; the wings spread out horizontally as in the case of a modern Anisopterous Dragonfly; the beautiful color-pattern perfect; and the macrotrichia on some of the veins quite clearly visible.

The Mayflies (Plectoptera) are abundant, and are all characterized by the presence of four almost equal wings, whose venation is almost exactly on the same plan as that of the forewing of the Order today, except that there is no definite tornus (this latter evidently developing in correlation with the reduction of the hindwing).

Of very great interest are the fine Protodonata, of which there are three very distinct species, inclusive of *Typus permianus* already discovered and described by Dr. Sellards. This genus, and an allied but larger form expanding about 15 inches, are undoubtedly true Meganeuridae; the other is a much smaller form allied to *Protagrion*. The largest specimen is almost perfect, and allows of the complete working out of the homologies of the wing-veins of this Order, which shows some close resemblances both to the Plectoptera and to recent Odonata.

Perhaps the most wonderful find of all, as regards its value in elucidating venational and phylogenetic problems, is the wing of an undoubted Zygopterous dragonfly of very remarkable structure. It is very slender, with long petiole, complete nodus and pterostigma, incomplete arculus, and with very few cross-veins placed very wide apart; *e. g.*, although the wing is very long, there are only four postnodals. This wing solves at once the whole problem of Dragonfly wing-venation, and shows what a will-of-the-wisp we have all been following over the supposed trachea Rs of Needham. The whole vein called M by all Odonatologists, inclusive of all its branches and Needham's Rs, is clearly seen to be the true radial sector, which is many-branched as in Plectoptera. The

missing vein M is present in the basilar space, but fuses with Cu half-way to arculus, and the two fused veins again part company under the open discoidal cell. This accounts for the anomaly of the supposed Cu of recent Odonata dividing into an upper *concave* (supposed) $Cu_1$ and a lower *convex* (supposed) $Cu_2$. The upper concave vein is really M, and the lower convex vein is really Cu. In the Protodonata, M remains a simple unfused vein, at any rate in the Meganeuridae. In the new Zygopteron, there is, of course, no anal vein, but the cross-vein Ac is present, placed well before the level of the first antenodal. Coupled with the evidence which I have obtained from a study of the Liassic Odonata, it is now perfectly clear that the original type of the Odonata was Zygopterous, with narrow, petiolate wings, and that the gradual broadening of the anal area led, on the one hand, to various Calopterygid types, and on the other to the Anisozygoptera, from which the true Anisoptera arose in the Jurassic. To Dr. C. H. Kennedy, of the Ohio State University, Columbus, Ohio, must be given credit of having first recognized, from his comparative studies of the penes of the males, the correct order of evolution of the various families of recent Odonata; and I wish here to express the satisfaction it gives me to be able to acknowledge the great merit of his work, and to close up, once and for all, the erroneous lines of thought which I, in company with almost every other student of Odonata, had been following for many years. In order that no avoidable delay shall take place in the publication of this most important discovery, I am arranging for the first part of my work on the Kansas fossils to include the Palaeodictyoptera, Protodonata and Odonata.

## The Life History of Phaedrotes piasus Boisd. (Lepidoptera : Lycaenidae).

By KARL R. COOLIDGE, Hollywood, California.

*Phaedrotes piasus* Bdv., better known in literature as *sagittigera* Felder, is a butterfly of wide range in the West, and in their recent Check List Drs. Barnes and McDunnough give it two races, formerly classed as synonyms, these being *catalina*

Reakirt and *daunia* Edw. The distinctions and limitations of these are not well known to lepidopterists of the Pacific Coast, and if some one in a postion to give them will kindly do so, I am sure such an article will be appreciated.

In Southern California occurs the race *catalina* Reakirt, subsequently called *rhea* by Boisduval, whose types came from Los Angeles. It is here a single-brooded butterfly, and no doubt this applies to the species thruout its entire range. In the immediate vicinity of Los Angeles the butterflies issue as early as the second week of March, but are not out in full force until April, the middle of April finding the brood at its height.

The butterflies are local, and are only rarely encountered at any distance from their food-plants, species of *Lupinus*. About Los Angeles I have found eggs on *L. hirsutissimus* Benth., and in Ventura County on *L. hallii* Abrams. I had supposed that Deerweed (*Hosackia glabra*) was a food plant, having on several occasions seen females fluttering about it, but larvae from *Lupinus* could not be induced to eat it.

The eggs are preferably laid on the young flower buds, but also frequently on both surfaces of the leaves, and even occasionally on the stems. Hatching, the young larvae at once bore into the flower buds, making headquarters in the stamen clusters. But after the first moult they feed outside, with their long necks entering the flower buds and eating out the contents thoroughly. Ants are constantly in attendance on the larger larvae.

As an instance of the great loss of butterfly life while in a larval stage, a check was made upon a large isolated plant of *Lupinus*.

On April 22, 1920, seventy-two eggs were noted on this plant. On May 7th the plant was carefully and thoroughly searched with the result that only six larvae were found. Very probably a spider (*Thomisus asperata*) and a little red mite (*Trombidium* sp.), both of which I found commonly on *Lupinus,* were responsible for the greater part of this destruction.

Following is the record of the larval moults:

Eggs laid April 11, 1920.
Hatched April 19.
Passed first moult April 24.
Passed second moult April 30.
Passed third moult May 6.
Passed fourth moult May 9.
Pupated May 14.

*The Egg.*—Demi-echinoid in shape, the base sharply flattened, thence swelling out roundly to the greatest diameter, from which point it rounds more quickly to the truncate summit.

Ornamented with the usual type of net-work, which divides itself into rather large mostly subquadrate cells, on the sides the smaller being about .04 mm. in their longest length, and the larger .06 mm. As the micropylar region is approached and reached the cells become smaller, but less confused than in most species. The cell walls .005 mm. in thickness, with the usual rounded protuberances at the angles, these .04 mm. in height and .02 mm. in thickness. The surface of the cells minutely punctate.

The micropyle in the center of a slope of the whole summit, in a deep, even, circular pit with abrupt walls, .06 mm. in diameter and composed of about twenty equal oval cells, .01 mm. in their longest length.

Color of egg pale green, with the raised net-work pure white. But as the embryo develops and just before the young larva hatches, the green color becomes lost, the ground color becoming a pale dirty violet but with the net-work remaining white. Height .26 mm., Diameter .58 mm. Diameter at base .40 mm.

The young larva escapes by eating out an irregular hole in the summit, about .35 mm. in diameter, and having once escaped from the egg, does not devour any more of it.

*First Instar.*—Body subcylindrical, barely tapering posteriorly, flattened beneath and less so above.

Head .12 mm. in diameter, dark brown. First thoracic segment pallid, with a number of large black papillae that project sharp colorless hairs over the head. Spiracles round, .01 mm. in diameter, with a black ring.

Two series of laterodorsal papillae, one of each to a segment, the larger .02 mm. in diameter at base, located centrally on the segments; the smaller .01 mm. in diameter, placed outside and a little back of the middle. The larger papillae emit long hairs, recurved posteriorly, .18 mm. in length; the hairs from the smaller papillae much shorter, only .04 mm. in length, and much less recurved.

Three series of substigmatal papillae, .01 mm. in height; these papillae also emit hairs, the first one .08 mm. in length; the second middle one .12 mm. in length; the posteriors but .04 mm. long. These

hairs, as well as the laterodorsals, are colorless and very minutely spiculiferous. A suprastigmatal series of small papillae, two to a segment, one placed anteriorly, the other slightly above and a little before the middle; from these come very short clavate hairs, .02 mm. in length. A laterodorsal row of naked lenticles, two to a segment on either side; the inner the smaller, .01 mm. in diameter, and the larger .016 mm.

Color of body pale olive brown, with a conspicuous hoary sheen, but as the instar develops this sheen becomes lost, and the larva alters to brownish orange. Legs fuscous. Prolegs concolorous with body. Length, just at birth, .90 mm. Width at first thoracic segment .24 mm.

*Second Instar.*—Head .24 mm. in diameter, dark chestnut brown, shining; the ocellar field white. Body now very minutely and uniformly punctulated with fine brown dots.

Color of body very pale lemon yellow, but as the stage proceeds the larva assumes a ground color of bright purple, with an indistinct white substigmatal stripe. Blotches of white on the sides represent the oblique dashes of later stages. Prolegs and ventral surface green white. Legs brown black. Length 2.20 mm. Width at first thoracic segment .54 mm.; width at anal segment .46 mm.

*Third Instar.*—Head .46 mm. in diameter, dark chestnut brown, shining.

Body densely studded with black stellate tubercles, .02 mm. in width, but varying slightly in size, and .03 mm. in height on the average; these project short, stout, minutely spiculiferous, colorless hairs, .06 mm. in height. Around first thoracic segment a fringe of colorless hairs, .28 mm. in length, extending out over the head. Along the substigmatal fold similar, erect, sharp hairs, .20 mm. in length. Mediodorsally on each segment, situated a little back of the middle, and on the whitish bands bordering the dorsal line, two high, black, stellate papillae, .04 mm. in height, from which issue erect colorless, sharp hairs, .[illegible] length. Spiracles round, pale, .02 mm. in diameter, with a [illegible] black ring.

Color, at beginning of instar, pale yellowish brown, but as the larva develops a dark purplish ground color is assumed, the coloration being strikingly similar to that of the young buds upon which the larva feeds. The substigmatal stripe becomes pink white, prominent, .14 mm. in width, extending the whole length of the body. A dorsal line, of a deeper tone than the ground color, and on either side of it a disconnected pink-tinged white stripe. On the sides similar colored dashes represent the usual type of oblique markings, but are here hardly more than irregular blotchings. In some of the larvae the substigmatal stripe and the lateral blotchings are entirely absent, the coloration being then almost uniformly deep

purple. Ventral surface greenish yellow; prolegs concolorous. Legs black. Abdominal slit greenish yellow.

Length, just after the moult, 4.8 mm. Width at second thoracic segment 1.36 mm.; height at second thoracic .95 mm.; width at anal segment .80 mm.

*Fourth Instar.*—Head .94 mm. in diameter, black, smooth, shining. Hairs of first thoracic segment, projecting over the head, of varying sizes, some as long as .30 mm., others but .12 mm.; these hairs sharp, colorless, spiculiferous, and having their origin in dark brown tubercles.

Body, as before, studded with stellate, piceous black tubercles, which give rise to short, stout, minutely spiculiferous hairs, .08 mm. in length on the average. Along the subventral rides a fringe of sharp, colorless, spiculiferous hairs, varying in size, some as long as .36 mm., others but .16 mm. Anal segment fringed with wavy, colorless, spiculiferous hairs, sharp, .30 mm. in length, arising from pale yellow brown tubercles .04 mm. in height. Spiracles round, pallid, .05 mm. in diameter, with a fine red brown ring. Sac and tubes present.

Color of body yellow brown. Dorsal line widest on the thoracic segments, thence narrowing posteriorly until disappearing on the last several abdominal segments. Dorsal line red brown, edged on either side with sordid yellow. The usual type of oblique dashes indicated rather feebly in sordid white stripes. A sordid white infrastigmatal stripe, fairly prominent, finely edged below with red brown. Ventral surface and prolegs blue green. Legs pale yellow brown, semi-opaque, darker at the tips.

Length 10. mm. Width at second thoracic segment 1.70 mm.; width at anal segment 1.50 mm.

*Fifth Instar.*—Head 1.1 mm. in diameter, black, smooth, shining. Hairs of first thoracic, extending out over head, .50 mm. in length, colorless, sharp, spiculiferous. Hairs fringing anal segment of varying sizes, some as long as .40 mm., others only .20 mm., all colorless, sharp, spiculiferous.

Body, as before, thickly studded with minute stellate processes, .04 mm. in diameter, the prongs sharp and widely separated. On the white backgrounds these are mostly glistening white; elsewhere mostly black, only a few red brown. The shorter spines .08 mm. in length, colorless, proceeding to a sharp point, minutely spiculiferous; the larger .40 mm. in length and .02 mm. in diameter at base, also colorless and minutely but densely spiculiferous. The sac green blue. Spiracles round oval, pale, .12 mm. in diameter, with a fine brownish ring.

Color of body yellow brown. A dorsal line, gray brown, heaviest and widest on thoracic segements, decreasing as it proceeds poste-

riorly and terminating sharply before the last two abdominal segments are reached. The usual type of oblique lateral dashes, the mediodorsal ones sordid white; the lower reddish brown. A sordid white infrastigmatal stripe, finely edged below with red brown, and the region just above it and between it and the oblique lateral dashes pale gray green. In another phase the ground color is bluish green, the dorsal stripe dark green but inconspicuous; the oblique lateral dashes only weakly indicated by grayish green, the sides with a pinkish tinge, and the infrastigmatal stripe is lacking. Ventral surface and prolegs bluish green. Legs pale yellow brown, semi-opaque, darker at tips.

Length 14.5 mm. Width at first thoracic segment 4. mm.; width at anal segment 3. mm.

*The Pupa.*—Viewed dorsally, sides of thorax fairly straight to abdominal segment 2, where a sudden swelling out takes place and then rounds, at first evenly, and then on the last two abdominals swiftly, to the rounded posterior end. Anterior end truncated.

Viewed laterally, the abdomen at segment 3 is seen to be considerably higher than the thorax, rather broadly arched and falling off rapidly posteriorly. The thorax is quite well rounded also, sloping sharply from its highest point to the part where the girdle passes.

Surface of body covered with an irregular tracery of scarcely raised pale brown lines, about .02 mm. in width; between these lines the surface is minutely punctate. Spiracles elongate ovate, .10 mm. in length, with a rich brown ring. A few, short, yellowish spines, the longest .05 mm. in length, terminating in a bunch of bristles; these seem to be only on the prothorax. Elsewhere, a few scattered simple hairs, stout, clavate, sometimes slightly curving, and but .08 mm. long.

Color of wing cases varying from bright bluish green to greenish yellow, but usually with the green predominating. This bluish green also sometimes covering the thorax, but usually the thorax is pale yellowish brown. Abdomen also pale yellowish brown, reddish brown ventrally, tho sometimes more or less tinged with bluish green. A fairly prominent, yellow, fuscous, dorsal line. On either side of dorsal line on the abdomen the usual series of fuscous blotchings, more or less obscure, and not sharply defined in any of the pupae examined. In one instance these blotchings were continued on the thorax. Tegment of wing cases translucent.

Length 9.5 mm. in one example, while three others gave 9. mm. Highest point of thorax 3. mm. Highest point of abdomen, at segment 3, 4. mm. Greatest width of thorax 3. mm. Greatest width of abdomen, at segment 3, 4. mm. Width of head case 2. mm.

# A New Race of Eurema proterpia[1] (Fabricius) (Lepid.: Pieridae).

By ALEX. B. KLOTS, New York, N. Y.

**Eurema proterpia watsonia,** new subspecies.

A very distinct race, differing from *proterpia* (Fabricius) in the following particulars.

♂.—Upperside—ground color slightly deeper orange. Outer margins of both primaries and secondaries with the smoky border darker and about double the width of *proterpia.* This is especially noticeable in the secondaries, where in *proterpia* the border is often practically missing. Veins of both wings heavily scaled with black throughout their entire length, except the veins closing the cells, and vein 5 of the primaries which is black for not quite half way to the cell from the outer margin. In *proterpia* the veins are black scaled for only about one-quarter to one-third of their distal portion. The black patch at apex of secondaries is more strongly developed, and there is also more of the dusting of black scales at the bases of both wings than in *proterpia.* Abdominal area and the area between veins 1 and 2 of the secondaries lightly dusted with black scales. In *proterpia* these areas are nearly clear of this black scaling.

Underside: primaries pale orange with a distinct yellow border along costal and outer margins which is barely indicated in *proterpia.* Secondaries yellow while in *proterpia* they are orange-yellow. There is at once noticeable a strong contrast between the colors of the primaries and secondaries. There is much less contrast in *proterpia,* some individuals, in fact, having the wings practically concolorous.

♀. of this race unknown.

Expanse of holotype—47.6 mm. (measurements taken from center of thorax to apex of each primary and results added).

Holotype male and twenty-one male paratypes, Rio Bamba, Ecuador, South America, deposited as follows: Holotype and one paratype in The American Museum of Natural History. One paratype in the collection of The Academy of Natural Sciences, Philadelphia. Nineteen paratypes in the author's collection.

I take great pleasure in naming this race for Mr. Frank E. Watson, in grateful recognition of the kind encouragement and assistance he has given me in the entomological field.

[1] *Papilio proterpia* Fabricius, 1775, Syst. Ent. p. 478, No. 152.

## Two Varieties of Eurosta solidaginis Fitch (Trypetidae, Dipt.).*

By C. Howard Curran, Ottawa, Ontario.

**Eurosta solidaginis** variety **fascipennis** new.

This variety is like the typical form but is readily distinguished by the presence of a complete, oblique, sub-apical hyaline band on the wing, a narrow, longer spot at the apex of the third longitudinal vein along the border and a smaller spot at the apex of the fourth vein.

*Holotype*—♂, Ottawa, Ont., June, 1908 (Jas. Fletcher); No. 609, in the Canadian National Collection, Ottawa.

**Eurosta solidaginis** variety **subfasciatus** new.

Intermediate between the typical and preceding forms in the presence of an interrupted, oblique fascia, as the triangle at the apex of the first vein is extended into the first posterior cell by means of a moderately large, clear oval spot. The apex of the wing is brown, with a transverse hyaline spot between the third and fourth veins and sometimes a small spot before the third vein. The outer clear spot on the hind margin also extends farther forward than in the typical form, and is usually narrower. The color of the wings is a duller brown.

*Holotype*—♂, Vernon, B. C., March 13, 1919 (E. R. Buckell); No. 610, in the Canadian National Collection, Ottawa. *Allotype*—♀, same data. *Paratypes*—3 ♂, 2 ♀, British Columbia. Reared from solidago galls.

## A Rearrangement of our North American Thyreocorinae (Hemip.).

By E. P. Van Duzee, San Francisco, California.†

Since the publication of my catalogue in 1917 two important papers treating of the Thyreocorinae have appeared. One by Dr. Horvath[1] in *Annales Musei Nationalis Hungarici,* XVII, pp. 205-273, and one by Mr. J. R. Malloch[2] in *Bulletin Illinois*

* Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agriculture, Ottawa.

† Contributions from the California Academy of Sciences, No. 220.

[1] Horvath, Dr. Geza, Analecta ad cognitionem Cydnidarum.

[2] Malloch, J. R., The Pentatomoidea of Illinois with keys to the Nearctic Genera. By Charles Arthur Hart. Edited by Mr. J. R. Malloch; the portion treating of the Thyreocorinae entirely by the editor.

*Natural History Survey,* XIII, pp. 206-216. Both appeared in 1919, but which has priority I have no means at present of knowing. However, it makes little difference which appeared first as, so far as I can discover, they do not necessarily conflict. Dr. Horvath's paper has the wider scope, covering the South American forms, but is not complete as to species and has the defect that he has misunderstood the genus *Corimelaena* White, and uses the name *Eucoria* Muls. & Rey in its place, the latter, apparently being a straight synonym of *Corimelaena,* His table of genera is invaluable and enables us to place our numerous neotropical species in systematic order. Mr. Malloch's paper deals only with North American forms and covers that ground well, the only serious omissions being the genus *Euryscytus* Horvath, the type species of which (*guttiger* Stål) comes up into southern Texas, and the genus *Amyssonotum* Horvath with a similar distribution. Malloch's new genus *Cydnoides* (*ciliatus* Uhler type) is very near *Acrotmetus* Horvath, but is, perhaps, sufficiently distinct in having the elytra more strongly punctured with an incomplete venation; the marginal cilia hardly form a satisfactory generic character as they are very small in one species and are present in the type of *Acrotmetus.* Mr. Malloch's determination of *Odontoscelis pulicarius* Germar is undoubtedly correct and should be accepted as final, but unfortunately he takes no notice of the names *marginella* Dallas, *flavomarginata* Thomas and *Eucoria marginipennis* Muls. & Rey, the latter of which Horvath now believes is an American form accidentally introduced into France. The former (*marginella* Dallas) is undoubtedly the same as *nanella* McAtee and *flavomarginata* apparently is another synonym.

*Corimelaena harti* Mall. I have taken at Washington, D. C., and Atlanta, Georgia; *marginella* (*nanella* McAtee) is abundant in Florida and was recorded by me as *pulicaria* in my report on Florida Hemiptera, and I have also taken it at Effingham, Kansas; *pulicaria* Germ. I have taken at Northbend, Washington, showing a distribution entirely across the northern part of the continent; *cognatus* Van D. is distributed from Jamaica to Lower California and undoubtedly occurs in California and

Arizona. In Malloch's table it runs to *extensa,* but may be distinguished by the narrower head, shorter scutellum, pale tibiae, etc. I have recently taken three males of *Cydnoides obtusa* Uhler from sand under a plant of *Euphorbia polycarpa* at Potholes, California, twelve miles north of Yuma. The two female types of this species recorded by Uhler are not now in the collection of the California Academy of Sciences; either they were not returned to the Academy as stated by Uhler or, through an oversight, they were not placed with the Academy's type collection and therefore were destroyed in the fire of 1906. However, the species is well described, very distinct and is not in doubt. The following two species should be added to our fauna:

**Cydnoides arizonensis** new species.

Larger than *ciliatus* with the broad truncate form of *renormatus;* head short, strongly sinuate either side; deep black, elytra immaculate. Length 5 mm., width 3.5 mm.

Head one-third wider than long, apex subangulate, sides deeply sinuate before the eyes; tylus well distinguished, parallel; surface flat, deeply, closely punctate, its base smooth. Pronotum large, convex, half as long as wide, but little narrowed anteriorly, sides strongly arcuate, very convex, edge marginate, humeri prominently tuberculate; surface deeply, closely punctate laterally, becoming nearly smooth on disk. Scutellum about as long as broad, regularly punctate, the punctures becoming subobsolete on basal disk. Elytra very broad, one-third as wide as long, strongly punctate, apex truncate, median field of corium punctured to its apex which becomes lost in the costal field a little before the apex; outer carina of corium complete, intermediate short. Sides of propleura deeply impressed beneath the very broadly overhanging margin. Second antennal segment scarcely longer than wide. Hind margin of basal genital plate of female rectilinear. Anterior femora with four antero-ventral bristles; spines on all tibiae long and stout. Sides of body with few and very short bristles. Color deep black, polished, with a slight bluish sheen in certain lights. Antennae and rostrum fusco-testaceous, tarsi still paler.

Described from one female taken by Mr. J. R. Slevin on Mt. Lemon, Arizona, June 17, 1912, at an elevation of 9150 feet. This species approaches genus *Acrotmetus* Horv. but the elytral characters seem to place it in *Cydnoides* in spite of the short cilia. *Type,* No. 1305, female, in Museum California Academy of Sciences.

**Euryscytus diminutus** new species.

Size and form of *Cydnoides obtusa* Uhler but with a short head, the median field of corium not perceptibly narrower apically and in all respects congeneric with *Euryscytus guttiger* (Stål); deep black, polished, immaculate except for the pale antennae, rostrum and tarsi. Length 3.5 mm.; width 2.4 mm.

Head one-half broader than long, broadly rounded before, the apex subtruncate; sides arcuate, not at all sinuate, edge feebly reflexed, surface nearly vertical, flat, closely punctate, basal margin smooth, raised above the plane of the pronotum. Pronotum prominently convex, strongly punctate, but little narrowed anteriorly; sides sharply arcuate, marginate; humeri prominent, tumid. Scutellum as long as broad, uniformly but less strongly punctate, broadly rounded behind. Elytra broad, shallowly punctate; apex strongly truncate; median field of corium parallel or nearly so on apical two-thirds. Basal three segments of antennae flavo-testaceous (others wanting). Rostrum attaining apex of intermediate coxae, piceo-testaceous. Legs piceous, tarsi flavo-testaceous. Tibial spurs about as in *guttiger* Stål, less stout than in *Cydnoides*. Male genital segment deeply excavated, its apical margin feebly arcuate, scarcely elevated.

Described from one male taken by Mr. Fordyce Grinnell, Jr., at Pasadena, California, July 30, 1909. *Type* in collection of the author. An intensely black little species with quite uniform punctuation. The tumid base of the head may be the result of an accidental depression of the front of the head but that is not likely.

Below I give a re-arrangement of our species with their new generic assignments.

Genus CORIMELAENA White (type *lateralis* Fabr.)
- (*Eucoria* Muls. & Rey)
- *anthracina* Uhler
- *polita* Malloch
- *lateralis* (Fabr.)
- *montana* (Van Duzee)
- *pulicaria* (Germar)
  - ?*marginipennis* (Muls. & Rey)
- *interrupta* Malloch
- *minutissima* Malloch
- *marginella* Dallas
  - *flavomarginata* (Thomas)
  - *nanella* McAtee
- *harti* Malloch
- *agrella* McAtee
- *cognata* (Van Duzee)
- *extensa* Uhler

Genus AMYSSONOTUM Horvath (type *rastrata* Stål)
- *rastrata* (Stål)

Genus GALGUPHA Amyot & Serville (type *atra* A. & S.)
- *atra* Amyot & Serville
  - *unicolor* Palisot
- *nitiduloides* (Wolff)
- *aterrima* Malloch
- *nigra* (Dallas)
- *denudata* (Uhler)
- *coerulescens* (Stål)
  - *cyanea* (Uhler)
  - *cyaneonigra* (Walker)

Genus CYDNOIDES Malloch (type *ciliata* Uhl.)
- *ciliata* (Uhler)
- *renormatus* (Uhler)
- *albipennis* (Say)
  - *sayi* (Van Duzee)
- *obtusus* (Uhler)
- *arizonensis* Van Duzee

Genus EURYSCYTUS Horvath (type *guttiger* (Stål)
- *guttiger* (Stål)
- *diminutus* Van Duzee

# Two New Varieties of Ants (Hymen.: Formicidae).

By M. R. SMITH, Agricultural and Mechanical College, Mississippi.

The writer has recently observed two new varieties of ants which seem worthy of description. One of these ants, *Aphaenogaster nigripes*, seems to be a very common variety in this locality as is indicated by the numerous specimens in the college collection here. Not only is this ant found in Mississippi but it also occurs in North and South Carolina. It is easily separated from the species by means of its very dark, shining legs. The body of *nigripes* is darker in color and more rough in sculpture than that of *lamellidens*.

The other new variety of ant is from Lagunitas, California. This ant is without doubt a member of the *caryae* group as is shown by its emarginate clypeus, general shape of body and color. Dr. Wheeler, who has a large collection of ants of the *caryae* group, states that this new variety, *essigi*, is more closely allied to the variety *clarithorax* than to any other ant of the group. Although *essigi* bears a striking resemblance to *clarithorax* in color, it differs from this ant in several respects; it has more flattened eyes, a more uniform glabrous or shining body appearance and it lacks the definite, elongate, piligerous foveolae on the clypeus and cheeks, which is characteristic of *clarithorax*.

**Camponotus caryae** var **essigi** var. nov.

*Worker major*: Length, 6.5-7 mm.

Head, excluding mandibles, about as broad as long, broader behind than in front, with noticeably excised posterior border and convex sides. Clypeus convex, subrectangular, apical border depressed and with a prominent notch or emargination. Frontal carinae lyrate. Eyes oblong, flattened. Antennal scapes not reaching the posterior corners of the head, slender at the base, gradually enlarging toward the tips. Thorax short, robust, with the pronotum narrower than the head; epinotum compressed laterally, the sub-equal base and the declivity forming at their juncture a slightly rounded, obtuse angle. Petiole with convex anterior and flattened posterior surface and rounded, entire border. Gaster oblong.

Head, thorax, petiole, gaster, appendages and antennae, with exception of the funiculi, smooth and shining. Mandibles shining, with scattered but distinct punctures. Head covered with distinct but scattered punctures, the punctures becoming less apparent on the posterior

corners and border of the head. Head, thorax and gaster finely shagreened, that on the gaster transverse and very fine, almost indistinct.

Hairs yellowish, erect, present on the gula, mandibles, clypeus, front and vertex of the head, the dorsal surface of the thorax, coxae of the legs, the superior border of the petiole and gaster. Tips of scapes, femora and tibiae with a few, small, erect hairs. Pubescence on the head and thorax short and sparse, longer on the gaster.

Reddish brown: head and abdomen darker, the latter black with a yellowish posterior border to each segment. The mandibles, clypeus, funiculi and posterior corners of the head lighter than the rest of the head; the posterior portion of the thorax and the petiole deeply tinged with black.

*Worker minor*: Length, 4-4.5 mm.

Head narrower in front than behind, with rounded posterior border and convex sides. Clypeus trapezoidal, convex, with anterior margin slightly cut out or emarginate. Scapes reaching past posterior corners of the head, not noticeably enlarged from base to tip. Thorax similar to that of the major worker but the pronotum is almost as wide as the head.

Hairs yellowish, erect, present on the gula, mandibles, clypeus, front and vertex of the head, the dorsal surface of the epinotum, the superior border of the petiole, the gaster and coxae of the legs.

Reddish brown: Head, mesonotum, epinotum, petiole and gaster darker; the antennae, pronotum and appendages lighter.

This beautiful variety was sent to the writer for determination by Professor E. O. Essig, of the Agricultural Experiment Station of the University of California. The ants were taken at Lagunitas, California, on June 23, 1913. The variety is named in honor of Professor Essig, who has very kindly sent the writer numerous Californian ants for identification.

*Camponotus essigi* is evidently a variety of the *caryae* group as is shown by its emarginate clypeus, its general shape, size and color. Nothing is known concerning its nesting habits but the ants undoubtedly, like their nearest relatives, live in galls, in niches under the bark or in limbs of trees.

This species may be distinguished from the other forms of the *caryae* group by its very striking glabrous or shining appearance, its much flattened eyes and by the reddish brown thorax and appendages, with darker head and abdomen. It is very closely allied to the variety *clarithorax,* which it resembles very much in color.

Described from seven workers; cotypes in the collections of Dr. W. M. Wheeler and the writer.

**Aphaenogaster lamellidens** Mayr. var. **nigripes** var. nov.

*Worker*:

This variety can easily be distinguished from the species by means of its color and sculpture.

The head, thorax, petiole and postpetiole are deep reddish brown and subopaque, the coxae of the legs and the gaster lighter and more glabrous, while the femora and tibiae are almost a shining black. The specimens of *Aphaenogaster lamellidens* before the writer are light yellowish red, with the head, thorax, petiole and postpetiole sub-opaque, the antennae and legs darker, the gaster light yellowish and shining.

The most striking difference between the two is the color of the legs; the femora and tibiae in *nigripes* being very dark, almost black and somewhat shining, while the femora and tibiae of *lamellidens* are not noticeably dark or shining.

The sculpture of the two is noticeably different; the head, thorax, petiole and postpetiole of the variety are much coarser and more rugose reticulate than in *lamellidens*, this being particularly true of the dorsal surface of these parts.

Specimens of this ant have been collected from various towns in Mississippi but particularly from the towns of Fulton, Columbus, Aberdeen, and A. and M. College. The writer has specimens in his collection from South Carolina and Dr. W. M. Wheeler reports that he has specimens from North Carolina. Judging from the records of distribution, this ant must be a rather stable and widely distributed southern variety of *lamellidens*.

There is considerable variation in the general color of *nigripes* but the dark color of the legs is always constant and furnishes a character which easily separates this ant from the species.

Described from ten workers; cotypes in the writer's collection.

Type locality: Agricultural & Mechanical College, Mississippi.

**Osmia cordata; A Correction (Hymen.: Megachilidae).**

In the *Journal of Animal Behavior*, Vol. I, pages 374-392, 1911, Dr. C. H. Turner published a paper entitled "Notes on the Behavior of a Parasitic Bee of the Family Stelidae." Probably on account of the green color of this bee, it has been wrongly named. These insects were part of the material used by me in a work entitled "The Biology of the Mud-daubing Wasp," (Journ. Animal Behavior, Vol. 6; 27-63, 1916), and have been identified by Mr. J. C. Crawford as *Osmia cordata* Robt.; in fact, Dr. Turner in his paper acknowledges this source of his material.

It had been Dr. Turner's intention to correct this error, but his untimely death makes this duty devolve upon me.—PHIL RAU, St. Louis, Missouri.

# Undescribed Crane-Flies from Argentina (Dipt. : Tipulidae). Part VII.

By Charles P. Alexander, Amherst, Massachusetts.

The crane-flies described at this time were collected by Dr. Charles Bruch and Señores Barreto, Durione and Weiser, and were sent to me for determination by Dr. Bruch. The types are preserved in the writer's collection.

**Geranomyia (Geranomyia) serotina** sp. n.

Rostrum elongate; antennae with the flagellar segments oval to subcylindrical; mesonotal praescutum pale fawn-brown with three gray stripes, the median one split by a capillary dark brown line; scutal lobes gray with the mesal and anterior margins dark brown; scutellum dark brown, the posterior margin broadly pale; femora uniformly brownish yellow; wings pale yellow; stigma small, pale brown; small brown spots on wing; *Sc* and *Rs* long; abdomen dark brown, the hypopygium light yellow.

♂. Length (excluding rostrum) 6 mm.; wing 8.2 mm.; rostrum 5 mm.

♀. Length (excluding rostrum) 7.5-8 mm.; wing 7.6-8 mm.; rostrum 5 mm.

Form stout. Rostrum elongate, dark brown, including the palpi. Antennae moderately elongate, dark brown, the basal half somewhat paler; flagellar segments oval to subcylindrical; verticils very short. Head dark brown, gray pruinose, paler brown on the vertex; a narrow silvery gray median line; vertex narrow.

Mesonotal praescutum pale fawn-brown with three indistinct gray stripes, the median one darker gray split by a capillary dark brown line that fades out before the suture; scutum with the median area light gray, the lobes darker gray with the mesal and anterior margins of each bordered with brown; scutellum broad, dark brown, gray pruinose, the posterior margin broadly pale; postnotum dark, gray pruinose. Pleura pale brown, gray pruinose; dorso-pleural membrane dull yellow. Halteres light yellow, the knobs brown.

Legs with coxae and trochanters yellow; femora dull yellow, passing into brownish yellow beyond the base; tibiae and tarsi dark brown.

Wings pale yellow, the costal and subcostal cells brighter; stigma small, oval pale brown; narrow brown seams at the origin of *Rs*, tip of *Sc*; on the supernumerary crossvein in cell *Sc*; along cord and outer end of cell *1st* $M_2$; veins brown. Venation: *Sc* long, $Sc_1$ extending almost to midlength of the long sector, $Sc_2$ at its tip; *Rs* very long, more than three times the basal deflection of $R_4+_5$; *r-m* relatively short or obliterated by the punctiform contact of $R_4+_5$ on $M_1+_2$; cell *1st* $M_2$ long,

approximately as long as $M_{1+2}$ beyond it; basal deflection of $Cu_1$ just before the fork of $M$, longer than $Cu_2$.

Abdomen dark brown, the sternites a little paler; male hypopygium light yellow.

*Holotyes*: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype*: ♀. *Paratopotypes*: 5 ♂ ♀.

**Geranomyia (Geranomyia) platensis** sp. n.

Rostrum short; head grayish yellow with two longitudinal dark brown lines that converge behind; mesonotal praescutum buffy with three narrow, dark brown lines; femora pale brown with a narrow, dark brown, subterminal ring preceded by a yellowish band; wings grayish subhyaline, the costal region more yellowish; a rather sparse brown pattern, including four costal areas; *Sc* ending a short distance beyond the origin of *Rs*; basal deflection of $Cu_1$ at or near the fork of *M*.

♂. Length (excluding rostrum) 5.5-5.8 mm.; wing 6.9 mm.; rostrum 1.8-2 mm.

♀. Length (excluding rostrum) 6.3 mm.; wing 7 mm.; rostrum 2 mm.

Rostrum comparatively short, dark brown. Antennae comparatively short, brown; basal flagellar segments globular, the intermediate segments short-oval, passing into oval near the tip of the organ. Head grayish yellow, the postgenae and sides of the vertex clearer gray; two conspicuous dark brown lines extend from the inner posterior angle of eyes, converging behind to the occiput.

Mesonotal praescutum light buffy with three narrow dark brown stripes that are rather approximated, the spaces slightly pruinose; median stripe not attaining suture; lateral stripes beginning at pseudosutural foveae; lateral margins of sclerite broadly dark brown; scutum with median area broadly whitish, the lobes gray, each almost encircled by a brownish black margin; scutellum and postnotum brownish testaceous. Pleura yellowish testaceous. Halteres rather short, brown, the base of the stem paler.

Legs with the coxae and trochanters obscure yellow; femora pale brown, brighter basally; a broad, dark brown, subterminal ring, preceded and followed by a yellowish ring, the apical ring very narrow and indistinct; tibiae and tarsi brown.

Wings grayish subhyaline, the costal and subcostal cells yellowish, the latter more intense; stigma brown, extended basad along $R_1$; conspicuous but relatively small brown clouds above arculus; at origin of *Rs;* at supernumerary crossvein in cell *Sc*; narrower and less distinct seams along cord and outer end of cell *1st* $M_2$; a small cloud at tip of $R_{2+3}$; veins dark brown, *Sc* and *R* largely yellow. Venation: *Sc* moderately long, extending a little beyond the origin of *Rs*, $Sc_2$ at the tip of $Sc_1$; a supernumerary crossvein in cell *Sc* near midlength of cell; *Rs* long, almost straight, nearly three times the length of the basal

deflection of $R_{4+5}$; *r* indistinct, about one and one-half times its length from the tip of $R_1$; cell *1st* $M_2$ pentagonal, a little widened distally; basal deflection of $Cu_1$ at or slightly before the fork of *M*; $Cu_2$ a little shorter than to about equal to the deflection of $Cu_1$.

Abdomen brown, the posterior margins of the segments darker, the basal tergite blackish; sternites pale brown.

*Holotype*: ♂, La Plata, April 1920 (Durione). *Allotopotype*: ♀. *Paratopotypes*: 2 ♀ ♀.

*Geranomyia platensis* belongs to the group of *G. insignis* (Loew).

**Geranomyia (Geranomyia) aequabilis** sp. n.

♂. Length (excluding rostrum) 5 mm.; wing 6.4-6.5 mm.; rostrum 3.1-3.3 mm.

♀. Length (excluding rostrum) 5.2-5.4 mm.; wing 6-6.2 mm.; rostrum 3-3.5 mm.

Closely related to *G. platensis* sp. n., from which it differs as follows: Size smaller but the rostrum very much longer. Antennae dark brown, the flagellar segments cylindrical. Mesonotum light gray, the praescutum with three, narrow, brownish black stripes, these subequal and about as wide as the interspaces; postnotum dark-colored, sparsely gray pruinose. Pleura and sternum light gray. Legs with the brown femoral band paler, narrower and more removed from the tip of the segment; yellow subterminal ring indistinct. Wings similar but the dark brown pattern much more extensive, the markings large and conspicuous; gray clouds at ends of anal veins. Venation: *Rs* slightly more arcuated at origin; veins beyond cell *1st* $M_2$ longer, $M_3$ beyond the cell being about equal to it in length; basal deflection of $Cu_1$ slightly before the fork of *M*; $Cu_2$ conspicuously longer than the basal deflection of $Cu_1$. Abdominal tergites dark brown, the sternites a little paler.

*Holotype*: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype*: ♀. *Paratopotypes*: 1 ♂, 1 ♀.

**Erioptera (Mesocyphona) immaculata fuscivena** subsp. n.

♂. Length 2.8 mm.; wing 3-3.3 mm.

♀. Length 3.1-3.3 mm.; wing 3.4-3.5 mm.

Very similar to typical *immaculata* Alexander (Middle America) but with the wing-veins conspicuously bordered with fuscous; region of stigma conspicuously suffused with pale fuscous, the basal third of the wing likewise strongly tinged with this color; the nearly hyaline areas include the cells in the vicinity of the cord, the outer end of cell *1st A* and most of cells from $R_2$ to *Cu* with the exception of the seams along the veins.

*Holotype*: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype*: ♀. *Paratopotypes*: 5 ♂ ♂.

**Eriocera andicola** sp. n.

Antennae short; head brownish black, the conspicuously bifid vertical tubercle fiery orange; mesonotal praescutum brownish gray with three, broad, dark brown stripes; scutellum and postnotum light gray; pleura gray; wings faintly infuscated, the costal region darker brown; cell $M_1$ lacking; abdomen long, black, segments three to five more or less reddish.

♂. Length 15.5 mm.; wing 10 mm.; abdomen alone 11.7 mm.

Rostrum and palpi dark brownish black. Antennae short, black, the basal segment sparsely dusted with a grayish yellow pollen; base of first flagellar segment a little paler. Head with the vertical tubercle conspicuously fiery orange; front and occiput dark brown, the posterior part of the vertex dusted with greenish yellow; vertical tubercle very large and high, deeply bifid.

Pronotum dark-colored, dusted with light gray, the lateral angles of the scutum with a brush of hairs. Mesonotal praescutum with three, broad, brown stripes, the interspaces with a grayish yellow pollen, less distinct behind; scutum light gray medially, the lobes dark brown; scutellum and postnotum light gray. Pleura dark, heavily dusted with light gray. Halteres short, brown, the knobs dark brown.

Legs with the coxae dark, dusted with light gray; trochanters dark brown; femora dark brown, the bases obscure yellow, narrowest on the fore legs, broadest on the hind legs; tibiae obscure yellowish brown, passing into dark brown at the tips, the yellowish color brightest on the posterior tibiae; tarsi short, brownish black.

Wings rather small for the size of the body, with a faint brown tinge, cells *C* and *Sc* darker brown; stigma rather ill-defined, brown; ill-defined brown seams at origin of *Rs*, along the cord and outer end of cell *1st* $M_2$; veins dark brown. Venation: $Sc_1$ at least twice $Sc_2$; cell $M_1$ lacking; basal deflection of $Cu_1$ just beyond the fork of *M*.

Abdomen elongate. Tergites black, the bases of segments three to five obscure reddish yellow; ninth segment dark reddish brown; sternites similar but all of segments three to five and eight and nine obscure reddish.

*Holotype*: ♂, Ciudad, Jujuy, March 19, 1920 (V. Weiser).

**Tipula barretoi** sp. n.

Generally similar to *T. bruchi* but smaller; antennal flagellum uniformly brownish black; wings more uniformly brownish, the brown and subhyaline areas less contrasted; abdomen reddish, the tergites with three dark brown stripes, male hypopygium with the eighth sternite having an elongate median lobe.

♂. Length 12-13 mm.; wing 13.5-14.5 mm.

Frontal prolongation of head pale brown, with a narrow, darker brown, lateral line; palpi dark brown. Antennae with the scape and

first flagellar segment conspicuously yellow; remainder of flagellum brownish black. Head light brownish yellow adjoining the inner margins of the eyes; occiput and posterior part of vertex light gray pruinose; center of vertex largely dark brown.

Mesonotal praescutum light brownish yellow with three conspicuous, dark brown stripes; median stripe with a paler central line, most distinct anteriorly, and a capillary brownish black vitta; lateral stripes narrow, crossing the suture onto the scutal lobes; remainder of mesonotum light gray with a capillary dark brown line. Pleura light gray pruinose; dorso-pleural membrane light yellow. Halteres light brown, the knobs dark brown.

Legs long and slender, the coxae light gray, trochanters dull yellow; femora brownish yellow, the tips broadly blackened, immediately before these tips with a brighter, subterminal, yellow ring; tibiae light brown, soon passing into brownish black; tarsi brownish black.

Wings with a somewhat uniform brownish tinge, cells *C* and *Sc* more yellowish, the latter inclined to brownish yellow; cell *Sc* with a brown mark at tip; another at origin of *Rs* and a third before midlength of the cell; these marks are smaller than the yellow interspaces; stigma pale brown; whitish areas distributed as follows: An obliterative area before the cord, including the base of cell *1st* $R_1$, the end of *R*, crossing cell *1st* $M_2$ into the bases of cells $M_4$ and $Cu_1$; an obliterative area beyond the cord includes the bases of cells $R_2$, $R_3$ and $R_5$; paler marks in cells *M*, *1st A* and *2nd A*; veins dark brown. Venation: Tip of vein $R_1$ pale and without macrotrichiae, cell *2nd* $R_1$ being longer than wide; petiole of cell $M_1$ longer than *m*.

Abdominal tergites reddish with three conspicuous dark brown stripes; lateral margins of the segments narrowly grayish; sternites gray, with a broad, conspicuous, velvety-brown, median stripe. Male hypopygium with the ninth tergite yellow, large and flattened; the conspicuous lateral lobes are obliquely truncated and sparsely provided with small irregular teeth; the median area is depressed and produced caudad as a triangular, shiny, median lobe. Eighth sternite with a single, conspicuous, median lobe that is elongate-oval, pale, margined with long pale setae.

*Holotype*: ♂, Monte Veloz, Buenos Aires, March 1920 (B. Barreto). *Allotopotype*: ♀. *Paratopotypes*: 4 ♂♂.

*Tipula barretoi* is named in honor of the collector. The species bears a certain resemblance to *T. bruchi* Alexander (Argentina) but is readily told by the diagnostic characters listed above.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., DECEMBER, 1923.

## AGAIN, GIVE!

The letter which the Joint Publication Committee of the Union of Biological Societies has sent out to the members of the constituent societies, proposing the publication of an abstracts journal for the biological sciences, recalls the editorial in the NEWS for July last on The Zoological Record. Thus far the responses received by the Library Committee of the Academy of Natural Sciences of Philadelphia to its appeal urging institutions interested in zoology to offer to the Zoological Society of London guarantees toward the expenses of the *Zoological Record* for the year ending July 1, 1924, have not been very encouraging. Even if the new abstracts journal becomes a reality, some time will elapse before it can begin its functions and it is indispensable that the *Record* be maintained, at least until the abstracts journal comes into being. We, therefore, renew our appeal for the support of the *Record*.

Whatever the zoological bibliography is to be—Zoological Record, Concilium Bibliographicum, a new abstracts journal or what not, a larger degree of co-operation than has existed in the past is a *sine qua non*. Institutions and individuals throughout the world must combine to furnish the necessary funds, it may be at a sacrifice. An institution must subscribe to several copies of the bibliography or the individuals working in it must each subscribe thereto. It will not do to look to any one organzation now existing, not even a Carnegie corporation, to finance such a tremendous and absolutely essential task as the production of the bibliography of zoology. Again we say: Give!

### Odonata of North Carolina (Libellulidae).

On June 28, 1923, I took *Celithemis ornata* and *C. amanda*, one of each within a few yards of one another at Havelock, N. C., near Lake Ellis. On June 30, I saw an *Epicordulia* flying high overhead at Wilmington, N. C., and watched it for several minutes, but it never came within fifteen feet of the ground; on the afternoon of the same day I took a *Celithemis eponina* at Wilmington. These last two are new to the North Carolina list. C. S. BRIMLEY, Raleigh, N. C.

**Cuterebra cuniculi in the Dog (Diptera : Oestridae).***

On October 14, 1922, the Laboratory of the Pennsylvania Bureau of Animal Industry at Philadelphia received for diagnosis a fly larva taken from the skin of a dog, by Dr. J. W. Vansant, a practicing veterinarian at Fox Chase, Philadelphia. According to the history received the animal was a small male Pomeranian. It had been in Florida during the previous winter and up to April, 1922. The larva was removed from the soft skin by the sheath. There was apparently no evidence that it was doing the dog any harm. It was further stated that so far as was known, the animal had never been in contact with rabbits.

The specimen was sent to Prof. J. M. Aldrich, Associate Curator at the National Museum, and identified by him as *Cuterebra cuniculi.*

According to Dr. Albert Hassall, of the Zoological Division of the Bureau of Animal Industry, Washington, but one record of the finding of *Cuterebra* larvae in dogs has been published. This was a case reported by Cecil French, in the Journal of Comparative Medicine and Veterinary Archives, Vol. 14, 1893, p. 379. This occurred at Montreal, Canada, and the larva was stated to be that of *Cuterebra emasculator.* It was found in the scrotum and according to the author, "The dog was apparently indifferent to the fact that the parasite was slowly emasculating him."

The genus *Cuterebra* is closely related to *Hypoderma,* the bot-fly of cattle. Its natural hosts are rodents and marsupials, and it occurs only sporadically in carnivors, but there are a number of records of *Cuterebra* from cats. With regard to the mode whereby they reach their positions beneath the skin, Prof. Aldrich, in the letter which I received from him, refers to a paper published by Parker and Wells, in the Journal of Parasitology, Vol. V, 1919, p. 100. These authors introduced newly hatched *Cuterebra* larvae into the mouth of a prairie dog, and found that several days later the maggot had passed through the tissues and gained the skin, where it was producing the characteristic lump. Prof. Aldrich then adds:

"It would seem from this that the species of *Cuterebra* ordinarily obtains entrance to the host through the mouth; and from this I conclude that dogs and cats, when they have these parasites, get them from swallowing the flesh of some rodent containing an early stage of the maggot, which then proceeds to make a host of the carnivorous animal instead of the rodent."

It is known that *Cuterebra* larvae are of slow growth, requiring several months to mature. The larva in question was not far from the pupal stage, and in consequence the dog may readily have been infected while in Florida.

The specimen is preserved in the collection of the National Museum, under the designation of Accession No. 69929.—Howard Crawley.

---

(*Contributions from the Bureau of Animal Industry of the Pennsylvania Department of Agriculture. New Series No. 16.)

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **6**—Journal of the New York Entomological Society. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **19**—Bulletin of the Brooklyn Entomological Society. **40**—Genera Insectorum, Diriges par P. Wytsman. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **68**—Science, Garrison on the Hudson, N. Y. **70**—Journal of Morphology, Philadelphia. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **114**—Entomologische Rundschau, Stuttgart. **133**—Zoologica. Scientific Contributions of the New York Zoological Society. **138**—American Museum Novitates, New York. **141**—Internationale Entomologische Zeitschrift, Guben, Germany. **150**—Jenaische Zeitschrift fur naturwissenschaft, Jena.

**GENERAL. Aurivillius, C.**—Zu Chr. Aurivillius siebzigstem geburtstage. **114,** xl, 1-2. **Hadwen, S.**—Insects affecting live stock. (Canada Dept. Agr. Bul. 20.) **Hopkins, A. D.**—A biographical sketch. **12,** xvi, 413-20. **Martini, E.**—Lehrbuch der medizinischen entomologie. Gustav Fischer, Jena, 1923, 462 pp., ill. **Muttkowski, R. A.**—Studies on the blood of insects. **19,** xviii, 127-36. **Pierce, W. D.**—The laws of nature as affecting insect abundance. (Lectures in Appl. Ent., Ser. 1, Pt. 2, No. 0, App., 33-52.) **Smith, R. H.**—Technique in studying by dissection the internal anatomy of small insects. **7,** xvi, 277-8. **Snyder et al.**—The progress of forest entomology in the United States. **12,** xvi, 413-20. **Strand, E.**—Bitte um einsendung von autobiographien. **114,** xl, 39. **de la Torre Bueno, J. R.**—On synopses and keys. **19,** xviii, 145-6. **Washburn, F. L.**—Notes on collecting insects in the Marquesas islands. **7,** xvi, 274-77. **Weiss, H. B.**—More notes on fungous insects. **4,** lv, 199-201.

**ANATOMY, PHYSIOLOGY, ETC. King, R. L.**—Heteromorphic homologous chromosomes in three species of Pseudotrimerotropis. (Ortho: Acrididae.) **70.** xxxviii, 19-64.

**ARACHNIDA AND MYRIOPODA. Garman, P.**—The occurrence of several new spider mites in Connecticut. Notes on the life history of the spruce mite. (Conn. Agr. Exp. Sta. Bul. 247, 338-42.) **Locket, G. H.**—Mating-habits of Lycosidae. **11,** xii, 493-502. **Savin, W. M.**—Friend spider. (Nature Mag., 1923, 281-88.)

**THE SMALLER ORDERS OF INSECTA. Cutright, C. R.**—Life history of Micromus posticus. **12,** xvi, 448-56. **John, O.**—On a case of probable regeneration of a leg in a thysanopteron. **11,** xii, 532-34.

**Cockerell, T. D. A.**—A new genus of mayflies from the miocene of Florissant, Colorado. **5,** xxx, 170-2.

**ORTHOPTERA. Tietz, H. M.**—The anatomy of the digestive system of the Carolina locust. **7,** xvi, 256-73. **Vignon, P.**—Que faut-il penser du mimetisme? (Rev. Scientifique, Paris, lxi, 515-20.)

**HEMIPTERA. Barber, G. W.**—A note on a recently introduced leafhopper. **5,** xxx, 155-7. **Bergevin, E.**—A propos de quelques nouveaux hemipteres piqueurs. (Bul. Soc. Hist. Nat. Afrique du Nord, 1923, 226-28.) **Fenton & Hartzeld.**—Bionomics and control of the potato leafhopper, Empoasca mali. (Iowa Agr. Exp. Sta. Res. Bul. No. 78.) **Drake, C. J.**—Heteróptera in the vicinity of Cranberry Lake. Contribution toward the life history of Galeatus peckhami. The life history of the birch tingitid, Corythucha pallipes. (Tech. Bul. No. 16, N. Y. Coll. Forestry, 54-86; 105-110; 111-16.) **Middleton, W.**—A note on the honey dew production of the aphid, Longistigma caryae. **12,** xvi, 446-8. **Mundinger, F. G.**—The life history of two species of Nabidae. (Tech. Bul. No. 16, N. Y. Coll. Forestry, 149-67.) **Osborn, H.**—Homoptera in the vicinity of Cranberry Lake. Life history notes on Cranberry Lake Homoptera. (Tech. Bul. N. Y. Coll. Forestry, No. 16, 24-54; 87-104.) **Osborn, & Drake.**—An ecological study of the Hemiptera of the Cranberry Lake region, New York. (Tech. Bul. N. Y. Col. Forestry, No. 16, 5-24.) **de la Torre Bueno, J. R.**—Taxonomic characters in Microvellia. **19,** xviii, 138-43. **Van Duzee, E. P.**—Notes on Lygaeus kalmii and allies. **4** lv, 214.

**McAtee & Malloch.**—Notes on American Bactrodinae and Saicinae. (Reduviidae) **7,** xvi, 247-55. **Wiley, G. O.**—A new species of Rheumatobates from Texas (Gerridae). **4,** lv, 202-5.

**LEPIDOPTERA. Barnes & Benjamin.**—Notes on aberrational names omitted from the Barnes and McDunnough check list. **4,** lv, 211-13. On the authorship of certain names. On the distribution of Lampra barnesi. **15,** xi, 129-31; 135-6. **Dyar, H. G.**—Food-

plant of Hyblaea puera. (Noctuidae). **15**, xi, 148. **Frohawk, F. W.**—Gynandromophous Pieris rapae. **9**, 1923, 235. **Gaede, M.**—Alte und neue Arctiinae des Berliner Zool. Mus. **114**, xl, 2-3. **Hamlin, J. C.**—Seasonal adaptation of a northern hemisphere insect to the southern hemisphere. (Melitara junctolineella.) **12**, xvi, 420-23. **Huggins, H. C.**—Variation in Lepidoptera. **9**, 1923, 238-40. **Komp, W. H. W.**—Notes on Culex floridanus. **15**, xi, 133-5. **Meyrick, E.**—Heterocera. Oecophoridae. Carposinidae. **40**, fasc. 180, 224 pp.; fasc. 179, 10 pp. **Niepeltz, W.**—Neue formen exotischer Rhopaloceren. **141**, xvii, 96. **Stichel, H.**—Beitrage zur kenntnis der Riodinidenfauna Sudamerikas. **45**, xviii, 268-83.

**Barnes & Benjamin.**—Synonymic notes with the description of a new genus. **19**, xviii, 123-6. **Blackmore, E. H.**—Some new noctuids from British Columbia. **4**, lv, 214-17.

**DIPTERA.** **Aldrich, J. M.**—The Aldrich collection of Diptera. **68**, lviii, 301. **Bequaert & Davis.**—Tabanidae of Staten Island and Long Island, N. Y. **19**, xviii, 113-22. **Bonne, C.**—A new Sabethes from Surinam (Culicidae). Variability of Anopheles tarsimaculata Goeldi. Notes on some Goeldia species from Surinam. **15**, xi, 122-3; 127-8; 128-9. **Bonne-Wepster & Bonne.**—A list of mosquitoes from Dutch Guiana. **15**, xi, 123-7. **Brues, C. T.**—Two myrmecophilous Phoridae from Br. Guiana. **133**, iii, 435-40. **Curran, C. H.**—Two examples of sexual dimorphism in the genus Sericomyia. [key to N. Am. and Eur. sps. of Sericomyia and Condidea is included in this article]. **15**, xi, 136-41. **Dyar, H. G.**—Notes on American Culex. Mosquitoes described by Von Humbolt. **15**, **xi**, 118-21; 121-2. **Edwards, F. W.**—Notes on the dipterous family Anisopodidae (Rhyphididae). **11**, xii, 475-93. **Shannon, R. C.**—The pleural sclerites of Diptera. **4**, lv, 219-20.

**Curran, C. H.**—Apparently undescribed Canadian Asilidae and Dolichopodidae. **4**, lv, 207-11. **Malloch, J. R.**—An amended synopsis of the genus Mydaea (Anthomyiidae). **4**, lv, 220-21. A new genus of Phoridae. **19**, xviii, 143-4. **Melander, A. L.**—The genus Lasiopogon. **5**, xxx, 135-45. **Phillips, V. T.**—A revision of the Trypetidae of northeastern America. **6**, xxxi, 119-55. **Seamans, H. L.**—An undescribed anthomyid in the Canadian national collection. **4**, lv, 221-2. **Shannon, R. C.**—Genera of Nearctic Calliphoridae, blowflies, with revision of the Calliphorini. **15**, xi, 101-18.

**COLEOPTERA.** **Blunck, H.**—Die entwicklung des Dytiscus marginalis vom ei bis zur imago. Teil 2. **104**, cxxi, 171-391. **Chapman, R. N.**—Observations on the life history of Taphrocerus gracilis (Buprestidae). (Cornell Agr. Exp. Sta., Mem. 67.) **Detwiler, J. D.**—Three little-known clover insects. (Cornell Univ. Agr. Exp. Sta., Bul. 420.) **Doane, R. W.**—Lepersinus californicus killing ash trees. **4**, lv, 217. **Mank, H. G.**—The biology of the Staphylinidae. **7**, xvi, 220-37. **Marcovitch, S.**—A root weevil (Stephanocleonus plumbeus)

reared from strawberry. **4**, lv, 218. **Reichensperger, A.**—Neue sudamerikanische Histeriden als gaste von wanderameisen und termiten. **45**, xviii, 243-52. **Stichel, W.**—Zur phylogenesis eines geologisch jungen formenkreises der kaefer, der Ditominen (Harpalidae). **45**, xviii, 209-42.

**Blackman, M. W.**—New species of Ipidae from Maine. Two new bark-beetles from Colorado. Description of Hylocurus parkinsoniae, with revisional notes on Hylocurus and Micrais. (Tech. Bul. N. Y. Coll. Forestry, No. 16, 117-36; 137-41; 142-48.) **Woodruff, L. B.**—A new species of Polydrusus. **6**, xxxi, 155-57.

**HYMENOPTERA. Bequaert, J.**—Enkele beschouwingen over kleuren en kleurgroepen bij plooivleugelige wespen. (Natuurw. Tijds., Antwerp, viii, 16-27.) **Brues, C. T.**—Termitobracon, a termitophilous braconid from British Guiana. **133**, iii, 427-32. **Clausen, C. P.**—The biology of Schizaspidia tenuicornis, a eucharid parasite of Camponotus. **7**. xvi, 195-219. **Emery, C.**—Formicidae, Subf. Myrmicinae. **40**, fasc. 174, 207-397. **Meade-Waldo, G.**—Apidae subf. Prosopidinae. **40**, fasc. 181, 45 pp. **Plath, O. E.**—Observations on the so-called trumpeter in bumblebee colonies. **5**, xxx, 146-54. **Robertson, C.**—Flower visits of insects. **5**, xxx, 158-69. **Sandhouse, G. A.**—A key to some South American bees belonging to the genus Halictus subgenus Chloralictus. (Jour. Wash. Ac. Sci., xiii, 383-92.) **Schmidt, H.**—Ueber den alterstod der biene. **150**, lix, 343-62. **Smith, M. R.**—The life history and habits of Bicyrtes quadrifasciata. (Bembicidae). **7**, xvi, 238-46. **Stumper, R.**—Le venin des fourmis. (La nature, li, 174-76.) **Wheeler, W. M.**—The occurrence of winged females in the ant genus Leptogenys, with descriptions of new species. **138**, No. 90.

**Cockerell, T. D. A.**—Some Colorado bees. **4**, lv, 205-6. **Hubter, A. R.**—Utah varieties of a rose root gall wasp. **5**, xxx, 173-4. **Kinsey, A. C.**—The gall wasp genus Neuroterus. (Indiana Univ. Stud., x, No. 58.) **Regen, W. S.**—An introductory study of the Psammocharinae with special reference to the American species of the genus Lophopompilus. **7**, xvi, 177-94. **Rohwer, S. A.**—Three new Pemphredonone wasps. (Jour. Wash. Ac. Sci., xiii, 369-71.)

## SPECIAL NOTICES

**Diptera Danica.**—By William Lundbeck, Part VI, Pipunculidae and Phoridae. Although this work treats only of the species occurring in Denmark, it is one of those thorough treatises which should be in the hands of all students of Diptera, especially those interested in the families of which the respective parts treat. It is published in the English language. The part above mentioned contains 447 pages and many illustrations. **Genera Insectorum.**—The recent fascicles of this noted work are noted above under Hymenoptera and Lepi-

doptera, by Emery, Meade-Waldo, and Meyrick. They have the usual proportion of colored plates. **The Hemiptera or Sucking Insects of Connecticut.**—By W. E. Britton, with the collaboration of other specialists. Bulletin No. 34, State of Connecticut Geological and Natural History Survey. Hartford, 1923, 807 pp., 20 pls. This should prove a valuable addition to the library of all students of Hemiptera, especially those interested in the species of this order occurring in the eastern United States. **Macrolepidoptera of the World.**—Fauna americana. Exotica part 304 and 305 of this work have just appeared. Part 304 begins volume 7; Noctuiformes, with the family Agaristidae by M. Draudt, with two colored plates. The same author treats of the hesperidian genera Discophellus to Cocceius in part 305, with two colored plates. **Papers from the Department of Forestry Entomology.**—Tech. Bull. No. 16, N. Y. State College of Forestry at Syracuse University. This number contains papers on Hemiptera and Coleoptera by Osborn, Drake, Mundinger and Blackmen. Reference to these will be found in the above bibliography.

---

TWENTY-SECOND REPORT OF THE STATE ENTOMOLOGIST OF CONNECTICUT for the year 1922, by W. E. BRITTON, PH. D.—In this report just issued (October, 1923), Dr. Britton has covered the year's work in his usual interesting and thorough manner. We find articles or notes on all of the more important pests—the gipsy-moth, the brown-tail moth, Oriental peach moth, etc.—as well as accounts of new or little known pests that have appeared on the economic horizon.

Persons who are interested in entomology, but who are not familiar with the reports of the Connecticut State Entomologist, will find it well worth their while to look into these reports at their earliest opportunity.

Dr. Britton's yearly reports are very valuable reference works in our libraries on economic entomology. The material is brought together in comprehensive form, and presented in an orderly manner, with convenient and accurate indices of contents, scientific and common names and valuable statistical matter. Other admirable features of these reports are the numerous original illustrations and the many fine photographs, the separate articles by various members of the entomological staff, and the pages on miscellaneous insects.

Always careful to have identifications of questionable species verified and checked by leading specialists, Dr. Britton's references are absolutely reliable.

While the primary object of these reports is to inform the people of Connecticut concerning the work carried on by the State Entomologist, they are also very useful to every person interested in the study of insects, and could well be followed by others as a guide in the preparation of this type of publication.—A. B. CHAMPLAIN, Bureau of Plant Industry, Department of Agriculture, Harrisburg, Pa.

# INDEX TO VOLUME XXXIV.

(* denotes *new* species, genera or varieties)

## GENERAL SUBJECTS



## OBITUARY NOTICES.



## PERSONALS.

REVIEWS.



GEOGRAPHICAL DISTRIBUTION.



## COLEOPTERA

## DIPTERA

## HEMIPTERA

### HYMENOPTERA



### LEPIDOPTERA

## ODONATA

## ORTHOPTERA



## SIPHONAPTERA



## ANOPLURA



## ARACHNIDA

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS

OF THE

## ENTOMOLOGICAL SECTION

OF

## THE ACADEMY OF NATURAL SCIENCES

OF

## PHILADELPHIA

---

**VOLUME XXXV, 1924**



---

PHILADELPHIA, PA.:
Logan Square
1924

The several numbers of the NEWS for 1924 were mailed at the Post Office at Philadelphia, Pa., as follows:

| | | |
|---|---|---|
| No. | 1—January | January 7, 1924 |
| " | 2—February | February 7 |
| " | 3—March | March 3 |
| " | 4—April | April 2 |
| " | 5—May | May 8 |
| " | 6—June | June 4 |
| " | 7—July | July 3 |
| " | 8—October | October 6 |
| " | 9—November | November 5 |

The date of mailing the December, 1924, number will be announced on the last page of the issue for January, 1925.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV JANUARY, 1924 No. 1

CONTENTS



# Notes on Injurious Southwestern Tenebrionidae (Col.).

By ROY E. CAMPBELL, U. S. Bureau of Entomology, Alhambra, California.

Several species of small tenebrionid beetles at various times have been observed causing damage to young plants in California. Every year complaints come from new and widely-separated localities, indicating either that the insects are becoming more injurious, or that the continued increase of cultivated crops has removed the native plants on which the beetles fed, compelling them to seek food on the crops. The damage is invariably caused by the adults feeding on the stems of young seedlings, such as peppers and lima beans as they are coming out of the ground, or by girdling the stems of tomatoes and peppers after they are transplanted.

Most of the species found belong to the genus *Blapstinus,* but the genera *Coniontis* and *Ulus* are also represented.

Wade[1] has observed in the semi-arid regions of the Middle West and West, where the larvae of several genera of Tenebrionidae, among them *Blapstinus,* are destructive to young wheat and other grains, that the insects occur most abundantly in sandy and sandy loam soil. In California, one species, *Ulus crassus* Lec[2] was found exclusively in such locations, usually near the edge of hills, or washes which had in time past been overflowed. *Blapstinus rufipes* Csy. and *B. dilatatus* Lec. have been taken both in sandy loam soil, and also in heavy, cloddy soils, while *Blapstinus coronadensis* Blaisd. and the species of *Coniontis* have been observed only in heavy soils.

In commenting on the work of *B. dilatatus* and *B. coronadensis* on transplanted pepper plants, Dr. F. E. Blaisdell says: "I believe that cloddy ground is favorable to the breeding and hiding of these small tenebrionids. In Contra Costa County, near San Francisco Bay, I have noticed the same thing—there it is *B. elongatus* Csy. that does the mischief."

W. B. Parker observed *Blapstinus* sp. at Perkins and Hamilton City in 1912 damaging young sugar beets. The plants were injured at the surface of the soil, and while they were not cut off, were chewed until many died.

In 1913 Vaile[3] reported that 100 acres of lima beans were severely damaged by *Coniontis subpubescens* Lec.[4] near Ventura. The beetles fed on the young plants just after they came up. He also said that *Blapstinus* sp. had been reported in previous years, but had not done as much damage as *Coniontis.* Poisoned baits, as applied for cutworms, killed many of the beetles, according to his observations, and such control was

[1] Wade, J. S. Notes on Ecology of Injurious Tenebrionidae, Ent. News, Vol. 32, No. 1, 1921.

[2] The writer is indebted to Dr. F. E. Blaisdell for identification of most of the species mentioned herein.

[3] Vaile, R. S. A tenebrionid beetle Injuring Beans, Monthly Bull. Cal. State Com. Hort. Vol. 11, page 591, 1913.

[4] Specimens collected by Graf near Ventura at this time were later identified by Dr. Blaisdell as *Coniontis muscula,* and this probably is the species to which Vaile refers.

recommended. *C. subpubescens* was collected by J. E. Graf in sugar beet fields near Compton in 1915. In 1918 *Coniontis muscula* Blaisd. was taken by H. J. Ryan at Santa Paula, Ventura County, where it was damaging young beans. About the same time *Coniontis globulina* Blaisd. was observed by the writer in a 50-acre tomato field along the coast near Oxnard. The beetles fed mostly on the stems, and to some extent on the foliage. More than half of the plants were killed, necessitating replanting. Feeding was also observed on young beets and lima beans.

During the years 1915 to 1919, C. F. Stahl observed *B. rufipes* in sugar beet fields of San José. Large numbers of beetles fed on young beets just after they came up, and often destroyed fields of ten acres or more. The growers reported successful control by the use of poisoned bait.

In Orange County about 3,000 acres of peppers are raised annually. The various fields are mostly in a well-settled section, surrounded by citrus and walnut orchards, and have been cultivated for a number of years. The soil is a light sandy loam. In 1918 *B. rufipes* and *B. dilatatus* were numerous in many of these pepper fields. The beetles fed on tiny plants and cut them off as they were coming out of the ground. Damage continued until the remaining plants were 3 or 4 inches high. All feeding was done on the stems at the surface. An average of 20 per cent of the plants in the districts was destroyed and several fields required replanting. The beetles had been observed by growers for several previous seasons, but to a much less extent. In the same year *B. rufipes* fed extensively on young sugar beets in several fields in Ventura County. One 60-acre field was so badly damaged that it was plowed up. In 1919 and other years recently, the same species is reported to have caused considerable damage to young tomato plants in the San Francisco Bay region, where in many of these fields considerable replanting was required. In 1921, *B. coronadensis* and *B. dilatatus* were very numerous in several fields of bell peppers in Orange County. These also fed on the stems of the plants after the latter had been transplanted into the field, and

in many cases completely girdled the stem. In the worst infested part of the field, as high as 25 per cent of the plants were finally killed, but the field in general suffered less than 5 per cent.

The pepper field in which the beetles were most numerous was at the mouth of a small valley, and had been farmed to irrigated crops for five years. Adjoining this field was a young lemon orchard which had been kept in clean culture during the summers, and in vegetables during the winters. Between the two fields was a dirt farm road which had not been previously plowed for several years. By far the greatest damage, as well as the most beetles, was in the rows near this old road. The soil was a heavy clay loam. A similar, but less severe infestation was in another field about a half mile distant at the top of a hill 100 feet higher.

Recently reports have been received from San Bernardino County that young potatoes near Colton had been injured by *B. coronadensis*. Over 600 acres were injured, and several fields entirely destroyed. In May, 1922, 90 per cent of the plants in a 7-acre field of tomatoes near Covina (Los Angeles County) were destroyed by this species inside of two days after planting.

In 1918, DeOng[5] reported a series of *Blapstinus* causing serious damage of a similar sort to young castor beans in southern California.

In 1919, Vorhies[6] reported that a small beetle, provisionally classified as *Blapstinus pimalis* Csy., destroyed cotton plants on the Mesa Experiment Farm, Arizona, by feeding just below the surface of the soil on the seedlings as they emerged from the ground. The plot was so badly damaged as to require replanting. It had been fertilized with cottonseed meal, and as the beetles fed so readily on crushed cotton seeds and lint, it appeared probable that they had been attracted to the field by the cottonseed meal. Irrigation of the affected area was

[5] DeOng, E. R., Jr. Econ. Ent. Vol. II, p. 480, 1918.

[6] Vorhies, C. T., 30th Annual Rept. Arizona Agr. Exp. Sta., p. 347, 1919.

effective in preventing damage to the replanting, and was suggested as a proper control measure.

In tests conducted by the writer, many *Blapstinus* after being submerged in water for periods up to 18 hours, were still alive and recovered on being removed from the water.

*Ulus crassus* Lec. was first observed in 1918 associated with and more abundant than the *Blapstinus* species which were feeding on the young peppers as they sprouted. They occurred in Ventura County, feeding on the lima beans as the latter appeared above ground. Also they exhibited similar habits on young melon plants grown on sandy soil near Los Angeles. On the melons, however, they fed on the stems of the plants, leaf stems, and to some extent on the foliage. In March, 1922, Mote[7] reported that practically all the tomato plants were girdled near the soil line in the Salt River Valley of Arizona. When the plant which the beetles girdle falls, they collect in the shade and feed on the remainder. The insects had not been observed in this district before, but were abundant the previous July in another district, where they attacked small seedling melon and pepper plants.

The feeding habits of these beetles are quite similar. They congregate in the soil about the plants, feeding mostly on the stems at the top of the ground, but to some extent, with *Ulus* and *Coniontis,* feeding on the leaves and leaf stems. The amount eaten by an individual beetle is small, but often such numbers feed on a single stem that it is either completely girdled or cut off. Often there will be a regular ring of beetles around one stem, and occasionally rings of several layers of beetles have been observed. As many as 26 *Ulus* were observed feeding on a single lima bean stem. Seventy-five *Blapstinus,* many of which were feeding, were counted in the soil immediately around the stem of a bell pepper plant. On the bell peppers, feeding appeared to be slow, and many times the wound would heal over; but often the girdled place was too large.

Feeding is mostly confined to the tender seedling plants, just as they come out of the ground; or to the tender stems of newly

[7] Mote, Don C. Insect Pest Survey Bulletin, U. S. D. A., Vol. 2, No. 2, May, 1922.

set-out plants. After a week or more, when the stems begin to get tougher and harder, damage to the stems becomes less. Whether the insects breed in the fields where damage by the adults occurs is not known. From the fact that large numbers of beetles are found in the fields, feeding on seedling plants and in a few days, or a week's time, the number is often much lessened, the possibility of migration is suggested.

It has been observed that neglected fields or those in which straw, trash or other debris have accumulated are much more subject to infestation than fields on which clean culture has been practiced.

## Control Measures

An early experiment with poisoned bran bait scattered along the rows in a field of peppers infested with *Blapstinus rufipes*, *B. dilatatus* and *Ulus crassus* was not effective. The weather was dry and the mash quickly became hard, in which condition it did not appear to be attractive to the beetles. During the present season, however, in a squash field infested by *B. coronadensis*, a handful or two of mash placed about each hill infested with from 30 to 75 beetles, killed between 70 to 90 per cent. of them. This mash apparently retained its attractiveness for at least a week. Poisoned bran mash has also been reported by Vaile to have been used successfully in Ventura County and by Stahl in Santa Clara County.

Laboratory tests with *Coniontis globulina* using tomato foliage sprayed with lead arsenate and Paris green killed the beetles in from one to five days, depending on the strength used. The beetles feed fairly freely on the poisoned foliage.

In the San Francisco Bay region, many tomato growers who have suffered damage in previous years, now make it a practice to wrap the stems of the plants just before they are set out. They use a soft paper, such as newspaper or tissue paper, cut in rectangles about 4 by 6 inches and wrap one tightly about the stem of each plant, from the cluster of roots to the lowest leaf. Planted thus, the stem is protected, and the growth is not hindered. In this district the poisoned bran mash has been used with success.

A number of experiments in fields of bell peppers from 6 to 8 inches high showed that if any fine dusty material, such as lime, tobacco dust or kaolin, is placed so as to entirely cover the ground immediately around the stems of the plants, feeding practically ceased. This work was done in fields of heavy soil, where the fine dust was able to penetrate the soil around the stem for a fourth- to a half-inch or more.

The lime was applied with a bellows duster. By using a wide-open feed and holding the discharge pipe close to the stem, it was possible to cover the ground completely on one side of the stem with a single puff of the bellows. By proceeding up a row, giving a puff to each plant, and then coming back along the same row, the circle of dust around the stem could be completed.

## On the Synonymy of Polia nimbosa Guenée (Phalaenidae=Noctuidae, Lepid.).

By Wm. Barnes and F. H. Benjamin, Decatur, Illinois.

**Polia nimbosa** Guenée.

1852, Gn., Sp. Gen., VI. Noct., II, 77, *Aplecta*.

1857, Walk., Cat. Lep. Het. B. M., XI, 555, *Eurois*.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I. 102, *Mamestra*.

1875, Speyer, Stett. Ent. Zeit., XXXVI, 142, *Mamestra*.

1891, Sm., Proc. U. S. N. M., XIV, 204, pl. VIII, f. 3 valve ♂ genitalia, *Mamestra*.

1893, Sm., Bull. U. S. N. M., XLIV, 114, *Mamestra*.

1905, Hamp., Cat. Lep. Phal. B. M., V, 115, pl. LXXXI, f. 14, *Polia*.

race **mystica** Smith.

1898, Sm., Ent. News, IX, 242, *Mamestra*.

1905, Hamp., Cat. Lep. Phal. B. M., V, 115, pl. LXXXI, f. 15, *Polia*.

Examination of the male genitalia shows *nimbosa* and *mystica* to apparently represent a single species. In Manitoba and Alberta this species has the primaries more heavily powdered with brownish and brownish-fuscous than typical eastern *nimbosa*. To this race Dr. Smith applied the name *mystica*. Specimens from the mainland of British Columbia show a tendency to become paler; thus approaching eastern *nimbosa*.

**race mysticoides** nov.

Vancouver Island produces very pale specimens with the

primaries only slightly powdered with fuscous; appearing whitish. There is also a tendence for the t. a. and t. p. lines to become obsolescent below the median vein; whereas in typical *nimbosa* and race *mystica* the lines are usually well marked. The genitalia appear the same as those of *nimbosa* and *mystica*.

*Type locality*: Duncans, Vancouver Island, B. C., (Hanham).

*Number and sexes of types*: Holotype ♂, 9-VII-14; Allotype ♀, 3-VII-12; 2 ♂ Paratypes, 13-VII-12, 23-VII-10; 8 ♀ Paratypes, various July dates; 1 ♀ Paratype, no date.

*Types* in: Barnes Collection; 1 ♀ Paratype 15-VII-14, Canadian National Collection; 1 ♀ Paratype 20-VII-10, E. H. Blackmore Collection.

## Three Supposed New Species of Ceraturgus (Diptera, Asilidae) from North Carolina.

By C. S. Brimley, Division of Entomology, N. C. Dept. of Agriculture, Raleigh, North Carolina.

In overhauling our species of this genus I find that we have three apparently new species in our collections; the descriptions follow.

**Ceraturgus elizabethae** n. sp.

Resembles *cruciatus* but is a little larger with the abdomen proportionately longer and more slender, and the antennae also longer. Differs from all our other species in having only one complete light pollinose cross-band on the abdomen.

♂. Black, face and cheeks golden yellow, pollinose, with a narrow black stripe down the center of the former, which is clothed with rather scant, long, black hairs, mystax black. Front and vertex black shining, the sides golden yellow, pollinose, as are also the posterior orbits. Antennae 6 mm. long, black, the fifth joint clothed with short dense black pile, the first joint longer than the second, the third more than twice as long as the first two together, the fourth very short, the fifth about as long as the third.

Thorax black with golden yellow, pollinose markings as follows: an elongate spot on the humeri, a similar spot extending from just in front of the transverse suture to some distance behind it, two dots on the suture near the middle, an elongate spot below the humeri, a dot above the base of each haltere, and

another above the hind coxae. Scutellum golden yellow, pollinose in the middle.

Wings smoky black, becoming hyaline towards the apex and on the posterior border.

Legs, the coxae mainly black with a pollinose spot on the hind pair, femora nearly black with a little yellow at the base of the middle and hind pairs and at the apex of the front and middle ones, tibiae and tarsi yellow, last joint of latter tinged more or less with dusky, front pulvilli black, the others yellow.

Abdomen with a narrow transverse band of golden yellow pollen on the apex of the first segment, and transversely elongate spots on the sides of the three following segments, these separated on the dorsum by more than their combined width, and decreasing in size posteriorly so that those on the sides of the fourth segment are barely perceptible: venter black.

Pile scantier everywhere than in *cruciatus,* that on the back of the head and at base of proboscis black, elsewhere varying shades of yellow. Length of body 17 mm.

♀. Similar to male, but pile of face and mystax scantier, and yellow in color instead of black. The elongate spot on the humeri unites with that at the suture and extends the whole length of the mesonotum. There is more yellow on the hind coxae and a yellow dot on the pleurae. All the femora yellow, the hind pairs darker, tibiae, tarsi and pulvilli all wholly yellow. Wings smoky all over, paler in the centers of the cells. Length 18 mm.

Two other females taken at Raleigh, June 21, 1922, by myself, and in late June, 1921, by T. B. Mitchell, are similar but have less yellow on the thorax and the yellow spots on the sides of the abdominal segments are lacking on the fourth in the first and on the third and fourth in the second specimen named.

*Type* male collected at Raleigh, North Carolina, June 16, 1922, by T. B. Mitchell. *Paratype* female taken *in coitu* with the type male.

Male type and female paratype will be deposited in the U. S. National Museum, female paratypes in our collection.

Named for my little friend, Elizabeth Dunn.

**Ceraturgus mitchelli** n. sp.

Gray or whitish, pollinose, with almost the entire vestiture white; resembles most closely Bach's description of *dimidiatus,* but differs in having only the front tibiae yellow and in having hyaline wings.

Black, face and cheeks whitish, pollinose, with long white hair, mystax white. Front dull whitish, pollinose, but black at base of antennae above and on a narrow stripe above this: ocellar area and occiput black, narrowly whitish, pollinose, on the sides, posterior orbits narrowly white, pollinose. Proboscis black, reddish at tip. Antennae about 4 mm. long, first and second joints about equal, third about twice as long as the first two together, fourth short, fifth about half as long as third, fourth and fifth covered with very short, dense, black pile, first and second with some long, white hairs. All the hair on the head white.

Thorax black with yellowish white pollen, this forming a broad stripe along each side of the mesonotum above the wing bases which unites with its fellow before the scutellum: two, narrow, submedian bands on the dorsum, broader in front, and a narrow line on the suture, the black consisting of a broad median longitudinal stripe, (faintly divided by a median line of whitish hairs) and two large rounded spots on the sides. Scutellum margined with whitish behind. Metanotum whitish pollinose on the sides. Pleurae black, extensively white, pollinose, but with one obliquely elongate spot of golden yellow pollen.

Legs, all the coxae whitish pollinose, all the trochanters and femora black, the front femora yellow at extreme tip, front tibiae and tarsi yellow with short yellow pile, the long hairs and bristles white, middle tibiae black, yellowish at base, middle tarsi black, yellowish beneath, hind tibiae black, yellowish at the knees, hind tarsi black above, slightly yellowish beneath. Front pulvilli black, the others yellow (as is also the case with the males of *cruciatus* and *elizabethae*). Claws black. Hairs and spines of the legs white, except that there are some black hairs and spines near the base of the hind femora and beneath the hind tarsi.

Wings hyaline, tinged with yellow in the costal region, veins blackish, except in the costal region where they are yellow.

Abdomen shining black with complete, moderately broad, white, pollinose crossbands on the apices of the first five segments, these produced forwards on the sides nearly or quite to the anterior margins, sixth segment with a triangular white pollinose spot on each side, seventh segment unmarked, a tuft of yellow hairs on each side of the hypopygium. Length of body 18 mm.

*Type* and only specimen taken at Swannanoa, North Carolina, May 26, 1923, by T. B. Mitchell for whom the species is named. Type will be deposited in the National Museum.

**Ceraturgus mabelae** n. sp.

Differs from the other species of the genus in having no black at all on the abdomen.

Dark brown, face and cheeks golden yellow, pollinose, mystax and beard yellow, front and occiput black, shining, narrowly golden, pollinose next the eyes, posterior orbits grayish pollinose, hairs of front, occiput and back of head black. Antennae about 3 mm. long, black, first and second joints subequal, third about one and one-half times as long as the first two together, fourth short, about as broad as long, broader at apex, fifth flattened, rather broad, tapering to the apex, clothed with short dense black pile. Hairs on the basal antennal joints black.

Thorax golden yellow, pollinose, with the usual broad, median dark stripe, and two large rounded dark spots on each side, scutellum and posterior part of mesonotum yellowish brown, the former golden yellow, pollinose, on the margin, a rounded golden yellow, pollinose spot on each side of the metanotum. Short hairs of the thoracic dorsum black, the long ones mainly yellow. Pleurae almost wholly golden, pollinose, this divided into spots by the sutures. Wings wholly hyaline. Legs dark yellowish brown, somewhat lighter on the front tarsi, all the coxae golden yellow, pollinose, hairs and spines of legs yellow.

Abdomen wholly yellowish brown above, each segment with a broad posterior band of golden pollen, the last three or four segments being almost wholly pollinose. Venter wholly yellowish. Length of body 12 mm.

Described from a single female collected in late May, 1920, at Linville Falls, North Carolina, by Franklin Sherman, Chief in Entomology. The type will be placed in the U. S. National Museum.

Resembles *nigripes* in size and *cruciatus* in shape.

Named for my young friend, Mabel Payne.

The following key appears to separate the species of *Ceraturgus* of which we have specimens or descriptions.

1. Abdomen without any black ................. *mabelae*
   Abdomen with black .......................... 2
2. Legs all black .............................. *nigripes*
   Legs partly yellow or yellowish ............. 3
3. None of the hair on the head black .......... 4
   Some of the hair on the head black .......... 6
4. Legs all yellow, body almost wholly golden yellow, pollinose, size small (length 8-9 mm.) ......... *aurulentus*

Legs largely black, size larger (length over 10 mm.) .. 5
5. Front tibiae yellow others black, wings hyaline. .*mitchelli*
Front and middle tibiae yellow, wings not hyaline *dimidiatus*
6. Only one complete light pollinose crossband on the abdomen, namely that on the first segment. . . . *elizabethae*
Several complete crossbands on abdomen .......... 7
7. Beard and mystax yellow, size smaller ......... *similis*
Beard black, mystax often partly so ......... *cruciatus*

## New Species and Forms of Lepidoptera (Heterocera).

By Wm. Barnes and F. H. Benjamin, Decatur, Illinois.

**Automeris zephyria** form **zephyriata** nov.

Entirely similar to *zephyria* but with the fuscous tints of the primaries, secondaries, and thorax, largely replaced by deep rufous.

*A. zephyria* form *zephyriata* holds the same relative position to *zephyria* that *A. pamina* form *aurosea* holds to *pamina*. It apparently emerges as an uncommon form in bred lots. Intergrades occur.

*Type locality*: High Rolls, New Mexico, (Bonniwell).

*Number and sexes of types*: Holotype ♂, April; Allotype ♀, April; 4 ♂ Paratypes, March (1), April (2), July (1); 2 ♀ Paratypes, no date.

**Epia jola** sp. nov.

1913, B. & McD., Contr. Nat. Hist. Lep. N. A., II, No. 1, 14, pl. VI, f. 11, as *ectrapela, Epia.*

Primaries: ground color whitish, heavily overlaid by fuscous shades; basal line black, double, included space white, waved from costa to below cell, thence obsolete; its point of obsolescence being marked by a broken, basal, black dash; t. a. line black, double, included space white, strongly and obliquely excurved to claviform, thence drawn to a mesal point on vein 1, thence distally produced to a point below vein 1; claviform large, outlined and more or less filled in by black; orbicular outlined by black, white filled with a central fuscous shade; an oblique white shade from orbicular to near inner margin; reniform outlined by black, white filled, with a darker central crescent which has a whitish center; a waved, fuscous, median shade, connecting the reniform with the distal end of the claviform, and the inner margin; t. p. line produced to points on the veins, black, double, included space white, strongly excurved from costa to about vein 4, incurved to inner margin; s. t. space with a black patch on costa, and sagittate black dashes between veins 2-3, 3-4, 4-5; s. t. line inwardly oblique from costa to about vein 7, broken, again starting on vein 7 almost parallel to outer margin, pro-

duced on veins 3 and 4 forming a small W-mark; terminal space not intersected by black dashes; a terminal line of black crescents between the veins; fringe whitish-gray, interlined by fuscous.

Secondaries: fuscous, somewhat paler basally, veins darker, with discal spot and median shade.

Beneath: whitish, powdered by black; both pairs of wings with discal spots and darker outer margins; secondaries showing obscure median and s. t. shade lines, and with the discal spot often connected to the base by a bar of black scales. *Expanse*: 28-33 mm.

Allied to *minorata*, but lacking the strong brown tinges, with the s. t. space much wider, dashes in the s. t. space not obsolescent (as in the type male of *minorata*, Havilah, Calif., Hy. Edw. Coll.), besides possessing less strongly laminated and ciliated antennae in the male.

Perhaps more closely allied to *ectrapela*, but much more brightly marked. Compared with the series in the Smith Collection it seems quite distinct from the female type from Agnes Lake, British Columbia, and nearer to specimens labeled *minorata*.

It is possible that further specimens may show intergrades with true *ectrapela*, but twenty-two specimens from Utah, seem to present an almost uniform appearance. Seven specimens from Wallace, Idaho, received through the kindness of Messrs. Doll and Marloff, seem to be the same species, altho slightly darker than the Utah specimens. Genitalically there appears to be a slight difference between the Utah and Idaho specimens in the spinulation of the penis, but this is probably individual. In order to insure against a mixed series, the types are restricted to the following:

*Type locality*: Eureka, Utah (Tom Spalding).

*Number and sexes of types*: Holotype ♂, 1 July 1921; Allotype ♀, 1 July 1921; 8 ♂, 12 ♀, Paratypes, various dates from 21 June to 1 August.

*Types* in: Barnes Collection; Paratypes, Brooklyn Museum, Canadian National, Marloff and Spalding Collections.

**Hyssia marloffi** sp. nov.

Primaries: ground color violaceous-gray, powdered with black; basal line black, double, outwardly oblique from costa to radius, thence almost erect to median vein where it becomes obsolescent; t. a. line black,

double, outwardly oblique from costa, interrupted by a slight tooth above cell, inwardly oblique from submedian fold, produced to a long point below vein 1; median shade black, outwardly oblique from costa to inner margin; t. p. line black, double, produced to small points on the veins, excurved from costa to about vein 5, thence inwardly oblique, with a slight curvature, to inner margin; s. t. line marked on the costa by a black patch, thence as a pale diffuse shade, marked by small black dots, to inner margin; terminal line of black dots; basal-t. a. area heavily powdered with black, disconcolorous with the basal half of the median area; orbicular present but obsolescent, faintly outlined by a few black scales; reniform large, more or less kidney-shaped, yellowish, with somewhat darker central crescent, obscured on median vein by fuscous; cell between median shade and reniform filled in with black; a black dash connecting the reniform with the t. p. line; another black dash, in submedian fold, connecting the basal line with the t. a. line, thence often faintly marked to the median shade; fringe basally checkered by a line of whitish blotches.

Secondaries fuscous, somewhat paler basally; fringe white, with a fuscous interline.

Beneath: primaries suffused with fuscous, with t. a. line marked on costa, a black discal spot, and t. p. line reproduced as a black shade, terminal line and fringes as on upper side. Secondaries: suffused with fuscous, paler basally, with black discal spot and median shade line, fringes as on upper side. Some of the maculation on the under side may be lost by suffusion. *Expanse*: 25-28 mm.

According to specimens compared with the type of *H. fasciata* Smith, the present species is closely allied, by the black dash connecting the reniform with the t. p. line, but presents a considerably different habitus due to the primaries being more heavily powdered with black, while the dash in the submedian fold, and the dark basal-t. a. area plus the dark area distad of the median shade causes the mesal half of the median area to present a strong contrast, appearing as a pale oblique band.

True *H. fasciata* is in the Barnes Collection only from "New Mexico (F. H. Snow)," and High Rolls, New Mexico, Bonniwell.

*Type localities and number and sexes of types*: Holotype ♂, Ft. Wingate, 8-15 July; Allotype ♀, id., 1-7 July; 2 ♂ Paratypes, id., 24-31 July, 1-7 Aug.; 2 ♂ Paratypes, Jemez Springs, 28 July 1921, (6400 ft.), 24-31 Aug.; 1 ♀ Paratype, id., 16-23 Aug.

*Types* in: Barnes Collection, except 1 ♂ Paratype, 28 July 1921, received from Mr. Fred Marloff for identification, and returned to him.

**Syneda athabasca** Neum.

1883, Neum., Papilio, III, 143, *Syneda*.

Mr. Neumoegen states in the original description, "secondaries yellowish white." The types in the Neumoegen Collection appear to have yellowish-white secondaries. A series of specimens from Calgary and Nordegg, Alberta, in the Barnes Collection, vary greatly in the color of the secondaries, but always showing at least a considerable yellowish tinge. The authors are unable to state whether the pale condition of the secondaries of some specimens is the result of fading while the insect is still alive, or while in collections, or due to chemical action of ammonia in poor killing bottles; or if there actually are individual differences.

**Syneda athabasca** race **crokeri** nov.

A series of eight specimens from Saskatchewan, and three specimens without locality, in the Barnes Collection, do not show the faintest trace of yellow on the secondaries. There are additional specimens in the Brooklyn Museum. It seems impossible that these specimens could have completely lost all trace of yellow, as such a condition is not present in hundreds of specimens of the various species of *Syneda* in the Barnes Collection.

The authors are inclined to consider the white hind-winged form a geographical race, although it appears to be more worthy of specific rank than many of the so-called "species" of *Syneda*. Most, and probably all, of the specimens were collected by A. J. Croker.

*Type localities and number and sexes of types*: Holotype ♂, Allotype ♀, 3 ♂, 1 ♀, Paratypes, "Sask. Canada, 27-6-07 A. J. Croker"; 1 ♀ Paratype, "Redvers, Sask. 27-6-07"; 1 ♀ Paratype, "Redvers, Sask. 4-6-06 A. J. C."; 1 ♀ Paratype "9-6-06"; and 2 ♀ Paratypes, no data, in Barnes Collection; also a series of specimens from A. J. Croker in the Brooklyn Museum Collection.

**Anticarsia schausi** sp. nov.

Head, thorax, abdomen and wings concolorous, brownish-rufous, more or less tinged with violaceous.

Primaries: t. a. line waved from costa to inner margin; orbicular a small yellowish dot; median shade line more or less obsolescent in some specimens, in others clearly defined, outwardly oblique from costa to reniform, thence inwardly oblique to inner margin, produced to points on veins 2 and 1; reniform yellowish, erect, narrow, with a black central line; t. p. line erect between costa and radius, excurved to vein 3, thence incurved, produced to a point on vein 1, s. t. line composed of black dots between the veins; terminal series of black dots between the veins connected by a few fuscous scales and a bright rufous line; fringes bright rufous, interlined by violaceous.

Secondaries: with black discal mark and median shade line; a subterminal series of dots corresponding to the s. t. line of the primaries present or absent; terminal line and fringes as on primaries.

Beneath: bright brownish-rufous, maculation similar to the upper side except that the t. a. line is absent and that the other lines and spots are more contrastingly black, more or less outlined by luteous-white; the veins bright red. *Expanse*: 37-40 mm.

The authors are enabled to describe the present species thru the kindness of Mr. Schaus, who supplied a specimen of *A. mixtura* Wlk. = *leucoma* F. F. & R. for comparison. *A. schausi* appears genitalically distinct, its closest ally being *ferruginea* Sm., from which it may be easily recognized, by the reniform being yellowish and not strongly broken by intersecting veins, and by its more even and less patchy appearance.

*Type localities and number and sexes of types*: Holotype ♂, Palmerlee, Cochise County, Arizona; 3 ♂ Paratypes, id.; 2 ♂ Paratypes, Southern Arizona (Poling); 6 ♂ Paratypes, Huachuca Mts., Arizona, the only dated specimen being from the Huachuca Mts., 8-15 October.

**Hemeroplanis finitima** race **concoloralis** nov.

Tibiae and underside of the primaries without secondary sexual characters. Head, collar, thorax, abdomen, and ground color of wings, concolorously dull brown.

Primaries: t. a. line blackish, punctiform, almost erect, only slightly incurved in submedian fold; orbicular not present; reniform poorly marked by a few blackish scales; t. p. line yellowish, almost erect from costa to vein 4, incurved in submedian fold, preceded by a punctiform black line; s. t. line punctiform, parallel to the outer margin, marked by black sagittate dashes and small violaceous spots between the veins; a terminal series of faint black dots between the veins; fringe concolorous with the primaries.

Secondaries: similar in color to the primaries, only very slightly paler basally, with an obsolescent discal spot and s. t. shade.

Beneath: primaries: dull brownish with a slight rufous cast; a faint blackish discal spot; median and s. t. shades blackish, parallel to the outer margin. Secondaries: pale, sprinkled with black atoms and strongly tinged with rufous; with blackish discal spot; blackish median and s. t. shades parallel to the outer margin. *Expanse*: 27 mm.

This form has been standing as possibly *H. reversalis* Sm., in the Barnes Collection. Examination of the type of *reversalis* in the Smith Collection proved that *reversalis* was more closely allied to *secundalis*.

*Concoloralis* is possibly a distinct species with a more northern habitat than *finitima*. The type is the only specimen the authors have seen from so far north in California, and it is not closely approached by over one hundred and thirty specimens representing *finitima* and its various forms. The t. p. line, especially on the underside where it shows as a "median shade," appears a little straighter than in typical *finitima*, and is not excurved below the costa.

As the name is based upon a single specimen, and mainly upon characters which are variable in the group, it appears best to describe it as a northern race of *finitima*. There are probably more names than species in the genus *Hemeroplanis* (=*Pleonectyptera*), but most of the names will eventually have at least "form" status.

*Type locality*: Shasta Retreat, Siskiyou County, California.

*Number and sexes of types*: Holotype ♂, 8-15 August, unique.

**Metalestra diabolica** sp. nov.

Ground color brownish rufous, but so covered with indistinct markings as to appear blackish.

Primaries: basal line rufous, obsolescent except on costa; t. a. line rufous, poorly defined, waved from costa to inner margin; orbicular a small round black dot, often obsolescent; median shade double, more or less diffused in a generally fuscous basal-median system of shades; the area between the median shades and the t. p. line rufous, more or less obscured by fuscous; reniform black, distinct; t. p. line black, produced to blunt points on the veins, rounded from costa, drawn in to a point opposite the cell, this point being marked by a black dot, again excurved to about vein 3, thence incurved to inner margin but interrupted by being produced to a point on vein 1; the t. p. line followed by a rufous shade line in contact with it for its entire length; s. t. line faint, yellowish-rufous, strongly bent inward below costa, opposite the cell, and in the submedian fold; terminal line composed of narrow, black

crescents, the hollows between the veins being filled by yellowish dots; fringe black, more or less checkered by yellowish.

Secondaries: basal area heavily obscured by black shades; discal spot large and black but often difficult to see because of being fused with, and obscured by, the black basal shadings; medial line narrow, black, more or less irregular, outwardly produced opposite the cell; followed by an obsolescent pale shade line; an s. t. intermediate pale shade line; terminal line, yellow dots, and fringes as on the primaries.

Beneath: ground color dirty-yellowish, heavily powdered with fuscous; terminal lines and fringes as on the upper side; primaries with a black discal dot and median shade line; secondaries with blackish discal dot bounded mesially and distally by blackish shade lines which make contact with it, ordinary median shade line black and distinct. *Expanse* 18-23 mm.

This is the *tantillus* of various authors. Specimens were sent to Sir George Hampson, who failed to match it in the British Museum, returning a specimen marked "not *tantillus*." A specimen of *monodia* agreed with the type of *tantillus*.

It is possible that Grote had a mixed type series as he records *tantillus* from Texas, but his description agrees identically with his type in the British Museum and not with *diabolica*, so the name is restricted to the British Museum type.

Both authors have personally compared specimens, of the two species involved, with the types of *monodia*, and the series of other *Metalestra* in the National Museum, where *diabolica* is placed as *tantillus*. Mr. Schaus kindly informed the junior author that no tropical species entered into the synonymy.

*M. diabolica* belongs to that group of *Metalestra* which lacks the yellowish dashes on the veins in the s. t. space at the ends of the points of the t. p. line. From *edilis* and *cincta* it may be told by its darker appearance and totally different habitus; from *miserulata* (=*irentis*) by the possession of either a large black discal spot on the secondaries or heavy banding which obscures the spot; while from *tantillus*, its closest ally, by not possessing a nearly unicolorous black appearance only interrupted by narrow broken, but strongly contrasting, whitish-yellow lines.

*Type localities and number and sexes of types*: Holotype ♂, San Benito, 16-23 June; Allotype ♀, id., 8-15 July; 8 ♂ Paratypes, id., 16-23 June (1); id., Aug. (1); Kerrville, April (2); id., no date (1); Black Jack Springs (1); Brownsville (1); Harris County, 16-23 Sept. (1); 2 ♀ Paratypes, San Benito (1); Brownsville, "5-11," Geo. Dorner (1), all Texas.

Types of all the forms here described as new are in the Barnes collection, unless otherwise stated.

## Entomological Uses for Yucca Stems.

By JAMES G. NEEDHAM, Cornell University, Ithaca, New York.

During my year as exchange professor in Pomona College, I lived in the land of magnificent yuccas. They grew sparingly scattered about the mesa near at hand, and more abundantly about the foot of the mountain slopes farther away, rising starkly above the chaparral to a height of 20 or 25 feet, a unique and conspicuous feature of the landscape.

On my first trip out from Claremont to the Cañons in the adjacent San Gabriel mountains in September, I broke off a dead yucca stem and took it home and cut it up in part into sections to be used for pin cushions—a use well known to the general public in yucca-land. Having stock left over, stock that was clean, white, very light in weight, soft and easily worked, I began to find new uses for it. The stems may readily be cut crosswise with a coping saw, or punched lengthwise with any thin-walled tubular instrument, or sliced in any direction with a sharp knife. The stems are commonly 3 to 6 inches in diameter at the base, composed of a thin, tough, yellow rind inclosing a soft white pith, that is easily penetrated or split lengthwise but that holds pins rather well, if they are inserted crosswise. These qualities adapt dry yucca to the following uses:

1. *Pinning blocks*: Short sections of the stem set up on end; these are the entomologists' pin cushions, known and used by many, especially in the southwest. They serve well as depth gauges in setting insects to a proper height on pins, if one grasp the pin heads uniformly and push the pin down through the body of the fresh insect until his finger tip just touches the pith. Glued to a heavier base that will keep them from toppling over, they will receive and hold scalpel, forceps, scissors, needles, etc., as well as pins.

2. *Cyanide caps for the bottom of killing bottles.* For this use the stem is cut lengthwise in thin sheets, say an eighth of an inch in thickness. The sheets are cut into circular discs to fit the inside of the killing bottle *tightly*. Shears will cut them readily. With powdered cyanide of potassium and a little dry

oxalic acid placed in the bottom of the bottle one of these discs is pressed down to the bottom by something having a broad, flat surface (such as the bottom of another smaller bottle) and then a second disc is added with its grain crosswise to that of the first one. The discs undergo compression at the edges and need no glue to keep them in place. They are easiest fitted into large shell vials, but may be bent up at the sides and inserted into any wide-mouth bottle. If smoothly cut the feet of the insect will not catch in them. They are porous, clean and white and easily replaceable. If the top one becomes soiled, a third one may be quickly added, making the bottle as new. They do not add weight, like plàster of paris, and they hold much better than blotting paper discs.

3. *Micro-blocks for pin-point mounting.* Only the finer textured pith is suitable for this; the rapidly-grown, open-meshed basal portion will not hold securely on the pins. Blocks of uniform size are easily obtained by punching suitable pith with a small metal tube, withdrawing the cylinder of pith from the tube and cutting it into pieces of uniform length. Into one of these pieces the micro pin, and the holding pin are inserted in the same way as into cork or paper strips. For a punch I used a 5-inch piece of small, thin-walled brass curtain rod.

4. *Spreading blocks.* These are made by shaving off a tagential lengthwise strip from two opposite faces of a thick block of yucca with a sharp knife, and cutting suitable groove or grooves on each of the two faces. I make the groove by punching out the pith beneath the face (as under 3) and then, with a sharp knife, cutting a slit down into the punched hole of a width adopted to the size of the bodies of the insects whose wings are to be spread. If a downward slope to the sides of the groove is desired it is easily obtained by shaving off the surface with a sharp knife. I make my blocks with a single median groove for macros on one side, and a pair of smaller grooves for micros on the other. The smooth white pith makes a nice soft surface on which to spread the most delicate wings, and it takes pins more readily than soft wood. I have abandoned the use of cumbersome and expensive modern pinning boards altogether.

5. *Small containers for duplicate micros.* When hundreds of parasites and hyperparasites were emerging from some of my rearing cages, and it seemed desirable to save them all, and I was put to it to find time to preserve them all in the usual way, some pieces of yucca pith out of which I had punched micro-blocks (as under 3) lay before me, and I used these for containers. I plugged one end of the hole with a piece of the pith punched from it, put in the freshly killed insects, plugged the other hole with cotton, and wrote the necessary data on the smooth surface of the pith, which takes ink very well. Since then I have sent small specimens of many sorts to specialists in this sort of containers. They may be softened in a water bath and opened by splitting, being of so small value and so easily replaceable.

6. *Small shipping cases for single vials.* Punch a hole to fit the vial lengthwise of a piece of yucca stem, insert the vial with a piece of the pith from the punch replaced in the ends of the hole, wrap, and mail, and save postage.

7. *Tops for small breeding cages.* An inch-long section of a large yucca stem may have the top end of a tin can pressed into it, making a closed cage. If a removable shell vial be first fitted into the yucca cap, the cage will be of the best sort for rearing insects that are attracted to light. The vial may be fitted to the place by using it to punch its own hole, and then removing the plug from its mouth, and then withdrawing the vial till its mouth is on a level with the inner surface of the pith. With a tin can, a pith section and a shell vial at hand such a cage can be made in two minutes. Nothing better can be had for rearing gall-makers, leaf-miners, and other small insects when found in the pupal stage.

This last is the most important use I have found for yucca stems.

The stems should be cut in August, when fully mature and before the rains have come to darken their color, and, of course, stems that are free from the all too frequent holes of burrowing beetles should be selected for these uses.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JANUARY, 1924.

## Loan of Types.

Types appear to be the court of last resort in systematic entomology. In the narrow sense they are the property of institutions or individuals. Broadly speaking they are the property of the entomological world at large and the individuals and institutions are holding them in trust for the students of the present and also for those that come after.

If loaned they are subjected to many kinds of risk and not infrequently lost or destroyed.

The systematic worker is often grieved when he is refused the loan of types and seldom considers that future students would apply censure to the owners, if lost or destroyed when loaned out.

If types were loaned, especially by an institution having thousands of them, it would become very burdensome to be sending them whenever there was an application. One distinguished American entomologist said: "If persons are obliged to see my types to identify species, my descriptive work must be faulty and not worth while."

It is a question whether a donor's types should be loaned without his consent if he is living. Not infrequently types are presented with the understanding that they are not to be loaned.

There are some individuals that have no moral sense and who will acquire specimens in any way possible and institutions can't be too careful in such matters.

It is probably safest not to loan types, especially those held as holotypes.—HENRY SKINNER.

## Agraulis vanillae Linn. on the Pacific Coast ( Lepid.; Nymphalidae).

The late W. G. Wright was mistaken when he wrote in his *Butterflies of the West Coast* that this species was not a native of the West Coast, but was introduced into California following the opening of the Southern Pacific Railroad from New Orleans, about 1885. The butterfly is certainly indigenous to the Mohave and Colorado Desert regions, and as early as 1876

was reported to be very abundant about San Diego. *Vanillae* is very common in Southern California, especially in the hotter fall months, but I have records of it for every month of the year. Above Santa Barbara County it becomes rarer, and I know of only several captures in the San Francisco Bay region. Several years ago I received from Mr. W. J. Chamberlin a specimen of *vanillae* taken at Corvallis, Oregon, in June. Very possibly this example was imported in some early stage on its food-plant.

The species of *Passiflora*, upon which *vanillae* feeds as a larva, are with the exception of a few Malayan, Chinese and Australian species, natives of tropical America. In California the commonest species is *P. caerulea,* and this seems to be the only one that can be grown successfully as far north as San Francisco. Other species are *P. edulis* Sims.; *P. laurifolia* Juss., the Jamaica Honeysuckle or Water Lemon; *P. mollissima* Bailey and the Red Passion Vine, *P. mandicata* Pers. Strangely, still another species, *P. radiata,* perhaps better known as *P. princeps,* appears to be immune from the attacks of the larvae of *vanillae*. I have never been able to locate any larvae on it, and horticulturists tell me that they regard it as caterpillar-proof. I have not been able to locate the food-plant of *vanillae* on the desert regions, but possibly species of *Trifolium* supply food for the larvae, as on several occasions I have noted females hovering about this as though bent on ovipositing.—KARL R. COOLIDGE, Hollywood, California.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of The American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **12**—Journal of Economic Entomology, Concord, N. H. **13**—Journal of Entomology and Zoology, Claremont, Cal. **14**—Proceedings of the Zoological Society of London. **21**—The Ento-

mologist's Record, London. **22**—Bulletin of Entomological Research, London. **40**—Genera Insectorum, Diriges par P. Wytsman. **44**—Ectoparasites. Edited by Jordan & Rothschild, Tring, England. **48**—Wiener Entomologische Zeitung. **49**—Entomologische Mitteilungen, Berlin-Dahlem. **52**—Zoologischer Anzeiger, Leipzig. **61**—Proceedings of the California Academy of Sciences, San Francisco. **68**—Science, Garrison on the Hudson, N. Y. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **71**—Novitates Zoologicae, Tring, England. **76**—Nature, London. **82**—The Ohio Journal of Science, Columbus, Ohio. **85**—The Journal of Experimental Zoology, Philadelphia. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **112**—Entomologische Berichten, The Hague. **118**—Die Naturwissenschaften, Berlin. **133**—Zoologica. Scientific Contributions of the New York Zoological Society. **134**—Annales de Biologie Lacustre, Brussels. **147**—Archiv fur Mikroskopische Anatomie und Entwicklungsmechanik, Berlin. **151**—Occasional Papers of the Boston Society of Natural History. **152**—United States Department of Agriculture.

**GENERAL. Colledge, W. R.**—An interesting insect larva. (Queensland Nat., 1923, 39-40.) **Eggers, F.**—Ergebnisse von untersuchungen am Johnstonschen organ der insekten und ihre bedeutung fur die allgemeine beurteilung der stiftfuhrenden sinnesorgane. **52**, lvii, 224-40. **Finkler, W.**—Die ueberpflanzung von insektenkopfen. **48**, xl, 77-80. Kopftransplantation an insekten. **147**, xcix, 104-133. **Graham, S. A.**—Effect of physical factors in the ecology of certain insects in logs. (Rep. Sta. Ent. Minn., xix, 22-40.) **Horn, W.**—Et meminisse et vaticinari liceat. 14. Ueber "Typen." **49**, xii, 210-13. **Hoyt, W. D.**—Some aspects of the relation of species to their environment. **68**, lvii, 432-4. **Karny, H. H.**—Ueber die anwendung der nomenklaturregeln. **49**, xii, 168-98. **Knoll, F.**—Insekten und blumen. Experimentelle arbeiten zur vertiefung unserer kenntnisse ueber die wechselbeziehungen zwischen pflanzen und tieren. (Abh. Z.-B. Ges. Wien, xii, H. 1-2.) **Rothschild, N. C.**—Obituary. **21**, xxxv, 175-6. **76**, cxii, 697. **Sheppard, T.**—Zoological bibliography. **76**, cxii, 652. **Summers, J. N.**—A refrigerator for shipping live insects. **12**, xvi, 539-43. **Tiegs, O. W.**—Researches on the insect metamorphosis. (Trans. R. Soc. So. Australia, xlvi, 319-527.) **Walton, W. R.**—Some phases of insect parasitism. (Can. Field-Nat., xxxvii, 128-32.) **West & Hull**—List of manuscript bibliographies in the biological sciences. (Rep. & Circ. Ser., Nat. Res. Council, No. 45.)

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC. Blunck, H.**—Krankheiten, feinde und schmarotzer des gelbrands. **52,** lvii, 296-328. **Mann, M. C.**—A demonstration of the stability of the genes of an inbred stock of Drosophila melanogaster under experimental condition. **85,** xxxviii, 213-44. **Mavor, J. W.**—An effect of X-rays on the linkage of mendelian characters in the first chromosome of Drosophila. (Genetics, viii 355-66.) **Redway, J. W.**—Disease carriers: Biological and geographical. (Ecology, iv, 335-40.) **Stieve, H.**—Neuzeitliche ansichten ueber die bedeutung der chromosomen, unter besonderer berucksichtigung der Drosophilaversuche. (Zeit. f. d. Ges. Anat., Berlin, Abt. 3, xxiv, 491-587.) **Toedtmann, W.**—Die spermatozoen von Gryllotalpa vulgaris. **52,** lvii, 287-91.

**ARACHNIDA AND MYRIOPODA. Kastener, A.**—Beitrage zur kenntnis der locomotion der Arachniden. **52,** lvii, 247-53.

**Chamberlin, R. V.**—On four termitophilous millipeds from British Guiana. **133,** iii, 411-21. ***Emerton, J. H.**—New spiders from Canada and the adjoining states, No. 3. **4,** lv, 238-43. **Oudemans, A. C.**—Acarologische aanteekeningen. **112,** vi, 200-8. ***Moore, J. I.**—A review of the present knowledge of fossil scorpions with the description of a new species from Pottsville formation of Clay County, Ind. (Proc. 38 An. Meet. Indiana Ac. Sci., 1922, 125-34.)

**THE SMALLER ORDERS OF INSECTA. Brocher, F.**—La corne prosternale des larves des Trichopteres. **134,** xii, 83-91. **Hegh, E.**—Les termites, Partie generale. Description, Distribution geographique, Classification, Biologie, Vie sociale, Alimentation, Constructions, Rapports avec le monde exterieur. [Reviewed in Psyche, xxx, Nos. 3-4, p. 133.] **Searle, J.**—The sticktight flea, Echidnophaga gallinacea. (Victorian Nat., xl, 119.)

***Chamberlin, J. C.**—A revision of the genus Anisembia, with description of a n. sp. from the Gulf of California. **61,** xii, 341-51. ***Claassen, P. W.**—News sps. of N. American Plecoptera. **4,** lv, 257-63. **Folsom, J. W.**—A new lepismid from Porto Rico. **10,** xxv, 170. Termitophilous Apterygota from British Guiana. **133,** iii, 385-402. **Silvestri, F.**—Descriptiones termitum in Anglorum Guiana repertorum. **133,** iii, 307-21. **Williamson, E. B.**—Notes on American species of Triacanthagyna and Gynacantha. (Misc. Pub. Univ. Mich., Mus. Zool., No. 9.)

**ORTHOPTERA. Bucknell, E. R.**—Cyphoderris monstrosa in British Columbia. **4,** lv, 225-30. **Mercier et Poisson,** Contribution a l'etude de l'atrophie des ailes et des muscles

du vol chez les Forficulidae. **69,** 1923, 1142-45. **Seliskar, A.**—Die mannlichen duftorgane der hohlenheuschrecke Troglophilus. **52,** lvii, 245-68. **Weiss, H. B.**—The chinese mantis, a beneficial insect in New Jersey. (N. J. Dept. Agr., Bur. Stat. & Insp., Circ. 68.)

**Hebard, M.**—Studies in the Dermaptera and Orthoptera of Colombia. Third paper. Orthopterous family Acrididae. **2,** xlix, 165-313.

**HEMIPTERA. Cragg, F. W.**—Observations on the bionomics of the bed-bug Cimex lectularis, with special reference to the relations of the sexes. (Ind. Jour. Med. Sci., xi, 449-73.) **Knight, H. H.**—Studies on the life history and biology of Perillus bioculatus, including observations on the nature of the color pattern. (Rep. Sta. Ent. Minn., xix, 50-96.) **Readio, P. A.**—The life history of Jalysus spinosus (Neididae). **4,** lv, 230-36.

**Chamberlin, J. C.**—A systematic monograph of the Tachardiinae or lax insects. (Coccidae). **22,** xiv, 147-212. ***Ferris, G. F.**—Observations on the Chermidae. **4,** lv, 250-56. **Green & Laing.**—Descriptions of some new sps. and some new records of Coccidae.—I. Diaspidinae. **22,** xiv, 123-32. **McAtee, W. L.**—Tingitoidea of the vicinity of Washington, D. C. **10,** xxv, 143-51. **Melichar, L.**—Homoptera. Fam. Acanaloniidae, Flatidae et Ricaniidae. **40,** Fasc. 182, 185 pp. **Morrison, H.**—On three apparently n. sps. of Termitaphis. **133,** iii, 403-8. ***Oestlund, O. W.**—A synoptical key to the Aphididae of Minnesota. (Rep. Sta. Ent. Minn., xix, 114-51.)

***Sanders & DeLong.**—Nine n. sps. of Cicadellidae from the U. S. and Canada. **10,** xxv, 151-56. ***Van Duzee, E. P.**—A new subsp. of Euryophthalmus cinctus. **4,** lv, 270.

**LEPIDOPTERA. Bishopp, F. C.**—The puss caterpillar and the effects of its sting on man. **152,** Dept. Circ. 288. **Butler, A. G.**—Reversion to ancestral colouration. **9,** lvi, 263. **Crozier, W. J.**—On the locomotion of the larvae of the slug moths (Cochlidiidae). **85,** xxxviii, 323-30. **Meadows, D. C.**—Notes on the lepidoptera of southern California. No. 1. **13,** xv, 33-4.

***Barnes & Benjamin.**—Notes on the egans-group of Oligia (Phalaenidae). **4,** lv, 264-5. **Gibson, A.**—The specific name of the green bud-moth. **4,** lv, 243. **Prout, L. B.**—New Geometridae in the Tring museum. **71,** xxx, 191-215. **Schaus, W.**—A new gen. and sp. of moth of economic interest in the U. S. Nat. Mus. **10,** xxv, 164. **Schaus & Cockerell.**—Three new forms of Rhopalocera from Colombia and a new geometrid moth from Madeira. **10,** xxv, 162-4.

**DIPTERA.** **Hearle, E.**—Notes on two mosquitoes from Br. Columbia. **4**, lv, 265-6.

**Aldrich, J. M.**—The present status of Coquillett's Hypochaeta longicornis. **10**, xxv, 161-2. **Austen, E. E.**—A revision of the family Pantophthalmidae, with descriptions of n. sps. and a n. gen. **14**, 1923, 551-598. ***Cole, F. R.**—Diptera from the islands and adjacent shores of the Gulf of California. **61**, xii, 457-481. ***Curran, C. H.**—A new dolichopodid from Ontario. **4**, lv, 236-7. The genera of the family Blepharoceridae. [Includes key to genera of the World.] A new syrphid from Ontario. **4**, lv, 266-9; 269. ***Garrett, C. B. D.**—Two new D. in the Canadian national collection, Ottawa. New North American D. **4**, lv, 244; 245-6. ***Greene, C. T.**—A new sp. of Volucella. **10**, xxv, 165-8. ***Johnson, C. W.**—New and interesting species of diptera. **151**, v, 69-72. ***Jordan & Rothschild.**—New American Siphonaptera. On the genera Rhopalopsyllus and Parapsyllus. **44**, i, 309-19; 320-70. **Schmitz, H.**—Zwei neue Phoriden aus Australien und Brasilien. **112**, vi, 188-92. ***Van Duzee, M. C.**—Diptera of the family Dolichopodidae, collected on the Katmai expedition. **82**, xxiii, 241-62.

**COLEOPTERA.** **Dodds, C. T.**—A list of coleoptera collected on the beach during the summer of 1921 at Laguna Beach, California. **13**, xv, 35-6. **Herrick, G. W.**—Notes on the biology of Desmocerus palliatus. **12**, xvi, 546-8. **Janisch, E.**—Ueber alterserscheinungen bei insekten und ihre bekampfungsphysiologische bedeutung. **118**, 1923, 929-31. **McIndoo, N. E.**—Glandular structure of the abdominal appendages of a termite guest (Spirachtha). **133**, iii, 367-81.

**Bernhauer, M.**—Neue Staphyliniden aus Sudamerika (29. Stuck). **48**, xl, 49-60. **Hyslop, J. A.**—The present status of the coleopterous family Plastoceridae. **10**, xxv, 156-60. **Mann, W. M.**—New genera and species of termitophilous coleoptera from northern S. Am. **133**, iii, 323-66.

**HYMENOPTERA.** **Caillas, A.**—Sur la composition de la propolis des abeilles **69**, 1923, 1145-47. **Howard, L. O.**—A curious phase of parasitism among the parasitic H. **4**, lv, 223-4. **Garlick, W. G.**—Notes on the feeding habits of an adult sawfly. **4**, lv, 256-7. **Logier, S.**—An interesting ant from Muskoka. **4**, lv, 247-9. **Plath, O. E.**—Breeding experiments with confined Bremus (Bombus) queens. **100**, xlv, 325-41.

***Mickel, C. E.**—Preliminary notes on the Mutillidae of Minnesota. (Rep. Sta. Ent., Minn., xix, 97-113.) ***Rohwer, S. A.**—A new Macrocentrus reared from the strawberry leaf roller (Braconidae). **10**, xxv, 168.

## SPECIAL NOTICES.

**List of manuscript bibliographies** in the biological sciences. This is one of the Reprint and Circulars of the National Research Council, No. 45. There are quite a number of entries under Insects; Taxonomy. Also under Entomology: Economic.

**Genera Insectorum.** This great work published under the direction of P. Wytsman, Tervueren, Belgium, is appearing in about its pre-war frequency. Of course, it is hardly necessary to state that this work should be consulted by all systematists in entomology. The part treating of the homopterous families Acanaloniidae, Flatidae and Ricaniidae, by L. Melichar has just appeared.

**Our attention** has been called to an error on our part occurring in the November list. Under Arachnida, the following titles should be credited to J. C. Chamberlin: New and little known pseudoscorpions, principally from the islands and adjacent shores of the Gulf of California; and A revision of the genus Anisembia, with descriptions of a new species. The latter should be listed under The Smaller Orders. [If the order had been mentioned in the latter title, this error would probably not have occurred.]

## Fossil Insects.[1]

In his day, our own S. H. Scudder was the leading exponent of the science of Palaeoentomology, but the modern representative of Scudder is Dr. A. Handlirsch of Vienna, whose monumental labors have greatly lightened the work of all others concerned with this subject. Not content with having produced that indispensable book, *Die Fossilen Insekten* (1430 pp.; 1906-1908), he has continued along the same lines, and in Schröder's *Handbuch* has given us a new summary, including a considerable amount of previously unpublished material. Even while this was being printed, he returned to his favorite study of the earlier forms, and has produced a *Revision der Paläozoischen Insekten,* published recently in Vienna. The topics dealt with by Handlirsch are so varied, including the whole problem of the descent and phylogenetic classification of the Insecta, that it is impossible to discuss them all in a review. Indeed, the subject re-

[1] Handbuch der Entomologie. By Dr. Chr. Schröder. Lief. 5-7. By A. Handlirsch. Consisting of Chapter 7, pp. 117-306, Palaeontologie, and Chapter 8, Phylogenie oder Stammesgeschichte, pp. 307-376. (Gustav Fischer, Jena: 1920, 1921.)

quires the coöperation of numerous entomologists, and far more analysis will be necessary before a really satisfactory synthesis can be made. It is already apparent that in certain quarters there is a tendency to accept the results of Handlirsch without question, out of regard for his great learning and enormous industry. It is too easily forgotten that such a comprehensive undertaking must necessarily be largely a matter of compilation from sources which are by no means always reliable, and that many judgments are tentative and subject to revision.

For the general entomologist as well as the student of fossils, the treatment in Schröder's *Handbuch* is full of instruction, if taken with sufficient caution. The broad results will stand; many of the details will have to be amended. Although the work is so recent, it was written too long ago to include Tillyard's Australian fossils, the new work on the Gurnet Bay (I. of Wight) fauna, the inclusions in Burmese amber, and various other remarkable discoveries. Among the recorded fossils, are many which on critical examination will need reinterpretation. Thus, Mr. F. W. Edwards, of the British Museum, has very recently reviewed the whole subject of fossil Culicidae or mosquitoes. Handlirsch, with due caution, catalogues the Culicidae from the Mesozoric with a query; and Edwards finds, on looking at the specimens, that it is quite impossible to definitely recognize any of them as belonging to that group. It has lately been reported (Amer. Mus. Novitates, No. 77, 1923) that butterflies and mosquitoes were found in the Ondai Sair formation of Mongolia, which is at least as old as the Cretaceous, and may even be Upper Jurassic. The material is now in my hands for description, and there are no butterflies, while the supposed mosquitoes are apparently Chironomidae.

The difficulty of correctly interpreting insect fossils has led many entomologists to turn away from the study in despair, and I have heard it said that too little reliance could be placed on the published records to render them of any value. This attitude is entirely wrong, overlooking the vast amount of indisputable and significant evidence which throws light on the whole subject of Entomology. Errors which have been made can often be corrected by renewed study, especially when we have more careful morphological treatments of the various parts of modern insects. There is hardly any part of an insect which does not show characteristic features, if we only know what these are, but they must be discovered by intensive comparative studies. Perhaps the most striking result of Paleoentomology is the discovery of the immense antiquity of insect structures, even of existing families and genera. This is now much more impres-

sive since the investigations of the disintegration of radio-active minerals have caused us to greatly increase our estimates of geological time. Why should insect organization be so extremely stable? It is not on account of its simplicity, for an insect is a wonderful and very complex machine. Species of insects appear to be short-lived, as shown by the Pleistocene remains, but genera and families persist while vertebrates change, and mountain ranges are raised up or levelled down. Mr. F. W. Edwards, in a recent study of the Anisopodidae (Rhyphidae), has come to the conclusion that my *Esthereva simplex* from the Colorado Eocene was placed in the wrong family on account of a misinterpretation of the structure of the antennae. I have no doubt that he is correct and that the species must stand as *Olbiogaster simplex*. This is not all; he finds that even the vastly more ancient (Jurassic) *Platyura fittoni* Brodie is to be called *Olbiogaster fittoni*. He did not notice that in the work now reviewed, Handlirsch figures a *Mesorhyphus nanus* from the Jurassic (Upper Lias) of Mecklenburg, and this, by the same tokens, is to be called *Olbiogaster nanus*. Now it is open to any one to say of these Jurassic flies, that probably if we had them alive the palpi, or legs, or thorax would show differential generic characters. This is a matter of speculation, but in any case we have positive evidence of the vast antiquity of the *Olbiogaster* venation. Such a fact is neither doubtful nor insignificant. Contrary to what we might expect, even the pattern of the wings (well shown in many fossils) is extremely stable as to its general character, sometimes more so than venation. It is amazing to find insects as old as the Upper Carboniferous (Pennsylvanian) showing the wing-markings. On p. 154 of the work reviewed, Handlirsch figures a remarkable example of this, *Narkema taeniatum* Handl. from the Pennsylvanian of Illinois. I have examined a second species of this genus, equally well marked, belonging to the Maryland Geological Survey.[2] I find very few misprints or clerical errors, but there is one which should be corrected. *Lithodryas* (p. 273) is a Nymphalid butterfly, not a Geometrid.—T. D. A. COCKERELL.

[2] **Narkema alternatum** n. sp. Resembling *N. taeniatum*, but media branching at a much greater distance from margin; black bands much wider, fully as wide as the intervals between them. Width of bands about 1.85 mm., of intervals about 1.40 mm. Benson's Clay Mine, Big Savage Mt., Mt. Savage fire clay horizon. Maryland.

[The genus *Narkema* is one of those of which Handlirsch is uncertain as to whether they should be referred to the order Protorthoptera or the order Protoblattoidea. See his *Revision der palaeozoischen Insekten,* 1919, pp. 551-552.—ED.]

## MacGillivray's External Insect Anatomy.

For the better part of a century taxonomy has been losing caste. It is time we admit this and try to discover the why of the situation. The work is an absolute necessity to many of the other biologic sciences. Its field holds much that is attractive; its methods have great value as training for embryo scientists. If there are adequate reasons for the decadence of systematics, they must lie in the way in which we systematists have been doing things, and the sooner we learn to do them differently the sooner taxonomy will engage the interest and esteem of other biologists.

This is the justification of an adverse criticism of MacGillivray's new book on "External Insect-Anatomy" (1923, Scarab Co., Urbana, Illinois).

The title page states that it is an "introduction to systematic entomology," and the preface adds that "the author in the preparation of this book has had foremost in mind the needs of students," that "a thorough knowledge of the external anatomy of insects is fundamental to their taxonomy," and that the first drafts of the book were laboratory outlines loaned to students. There is no question that this is conceived to be the material which should be presented to a student in insect taxonomy.

In the face of this claim, the book gives no attention to the elucidation of the principles involved in making distinctions, but is concerned with the minute morphology of insects. The student is directed to examine insect after insect in close detail, and then,—to learn names for each minutest structure.

I have had some slight experience with insect morphology; I cannot escape the impression that words, big words, new words, strange and fearful words are the meat and dessert of this new course. Granting that my judgment may not be ripened in wisdom, I still wonder what impression would be made upon a beginner who, perchance, wanders into an entomology course because the University schedule happens to work that way, or because he has a vague but uninformed idea that the insect world might have enchantments worth investigating. He has been told that the out-of-doors is worth a real man's observations; he has heard that ants and wasps and some other small creatures have surprising and entrancing ways. Perhaps the stray student has even tasted the truth of this idea,—just enough to persuade him into a course in insect taxonomy. He understands that in science he will do things very exactly, and will pay attention to many details, but only because these are the stepping stones to knowledge and consequent enjoyment. Don't

doubt for a moment that the student thinks of the goal of it all! He probably knows better than the scientist, for he is not yet lost in minutiae, and he still sees their relation to the rest of life. All of us engaged in teaching ought to remember that the student's viewpoint is liable to be very normal. And so, a normal individual is ready to submit to rigid training. Is he to be satisfied or sufficiently rewarded? Let us begin by introducing him to the "tummy" of a ground beetle, as follows (page 190):

"*Mesosternum.*—The mesosternum is the mesal subtriangular area. The mesocoxacavae are subadjacent and formed by the infolding of the adjacent parts of the mesosternum and metasternum. The mesocoxacoriae are small and concealed in the cephalic part of the mesocoxacavae. The mesocoxae are said to be closed when, as in this insect, they are completely surrounded externally by the mesosternum and metasternum, so that the mesepimera do not reach the mesocoxacavae. The mesosternoideae are completely fused with the mesepisterna. The exposed part of the mesosternum belongs to the mesosternannum. The suture along each lateral margin is a mesotrocasuture. The cephalic* mesosternannum* hyposternum* mesotrocasutures* caudad* mesocoxacava* mesal* mesosternannum* mesocoxacavae* metacoxal* mesofurca* mesopleuradema* mesofurcella* mesofurcinae* mesosternellum* mesotrochantin* mesotrocoila* mesocoxella * * *" and so on to the end of the paragraph! And so on for pages! And so on for 380 pages!

The book might be designed as a study in morphologic homologies. That, it is not, for no adequate studies of embryology or paleontology have been made to warrant such extensive treatments, and the material is so arranged in a running text that it would be difficult to discover any co-ordination which may exist. As a dictionary of terms employed, it is useless. Dictionaries are not written in solid text. Many of the terms are not of accepted standing; they are either quite new, or unusual, or given new meanings. In regard to the latter, on page 254 appears the calm statement that by substituting the new term larvapod, the term proleg is thereby freed for use with an entirely new meaning! Worst of all, most of the technical terms are quite uncalled for. It is getting bad when we have to call a left leg of an insect a "sinistral leg." (At that point the word leg should have been displaced by a new derivative from the Greek, for an insect leg is really not homologous with the mammalian appendage which is properly called a leg!) It is getting worse when the left front leg has to be called the sinistral proleg, when

the middle leg becomes the mesoleg, the hind leg the metaleg, etc., etc. And were I, an humble student, asked to draw the cephalic aspect of the dextral metaleg, I might be tempted to wonder what scientists were anyway, or I might use profanity, —unless my sense of humor survived!

In a very few hours' time one can teach a beginning student enough about the external anatomy of a particular family of insects to have him interpret the taxonomic literature on that group; and that is about all the anatomy he needs in taxonomy until he is ready to make specialized studies in homologies between diverse groups. After the initial lesson, I would engage his time with such exercises as would illustrate and drill him in the principles employed in making keen distinctions. These principles are worth while things in our science, and the only worth-while things beyond the practical utility of the subject in other fields of biology. Teach the student to recognize scant differences, to utilize obscure and varied data, to coordinate conflicting evidence, to know the inadequacies of conclusions, the necessity for wary judgments. This training will do more to make him a good taxonomist than any number of pages of names of morphologic structures. This training will be of inestimable value to the student who enters other fields of research. More, it will be a training fit for the man who has no plans for further study of zoology or botany but who, in the every-day affairs of life, has need of knowing how to make judgments of just the sort which the taxonomist is continually making.—Alfred C. Kinsey, Indiana University, Bloomington, Indiana.

# Doings of Societies.

## Entomological Section, Academy of Natural Sciences of Philadelphia.

Meeting held November 16, 1922. Director Philip Laurent presided; nine persons present.

Myriopods.—Dr. Skinner read a letter about an infestation by millipeds of a house at Haverford. Mr. Kisliuk reported an infestation of a field of introduced bleeding-hearts by this pest working in the roots, the entire planting being destroyed.

Lepidoptera.—Mr. Williams made a brief communication on his researches in the lepidopterous family Hesperiidae, showing some important genitalic characteristics.

Diptera.—Mr. Cresson spoke about some of the conspicuous

genitalic appendages of the dipterous family Micropezidae, showing a few of the more striking forms.

Mr. Laurent commented on the diversity of terms used for the same parts of the genitalic structure.

---

Meeting of December 11, 1922. Director Philip Laurent in the chair with 10 persons present.

Mr. R. J. Titherington was nominated for membership.

Dr. Calvert read a paper on the distribution of insects and some theories on evolution which was freely discussed by those present.

The following Officers and Committee were elected to serve for the ensuing year: *Director,* Philip Laurent; *Vice-Director,* Roswell C. Williams; *Secretary,* James A. G. Rehn, *Recorder,* Ezra T. Cresson, Jr.; *Treasurer,* Ezra T. Cresson; *Conservator,* Henry Skinner; *Publication Committee,* E. T. Cresson, Philip P. Calvert, E. T. Cresson, Jr.—E. T. CRESSON, JR., *Recorder.*

---

Meeting of Jan. 25, 1923. Vice Director R. C. Williams presided; five persons present.

The chairman read a translation of a notice of the death of Dr. Kalman Kertesz, the distinguished Hungarian dipterist and Director of the National Hungarian Museum.

HYMENOPTERA.—A letter from Mr. T. H. Frison, relative to the great value of the collection of Bremidae (Bombidae) at the Academy, was read.

DIPTERA.—Mr. Hornig spoke regarding the presence and emergence of *Musca domestica* on the city dumps as early as the 19th of this month.

ORTHOPTERA.—The same speaker exhibited several slides of the egg-mass of *Tenodera sinensis,* sectioned, showing the method in which the eggs are placed within the mass. Mr. Rehn exhibited several boxes of specimens illustrating certain results of the field work being done in the Orthoptera by Mr. Hebard and himself.

Robert J. Titherington was elected a member.—J. A. G. REHN, *Acting Recorder.*

---

Meeting of May 24, 1923. Vice-Director R. C. Williams, Jr., presided; eleven persons present.

Dr. Calvert made a brief communication on some early writers on American Entomology, particularly John Bartram and John Banister in and about the year 1700.

ORTHOPTERA.—Mr. Rehn made a few remarks on a recently completed paper on the West Indian Blattidae.

HYMENOPTERA.—Dr. Bradley gave a brief account of his work on a classification of the Hymenoptera, particularly mentioning the ready co-operation given him by several of the world's foremost students in the order. He stated that so far a tentative classification has been reached regarding most of the families. The chair congratulated Dr. Bradley on his success in securing such effective co-operation and on the extent of progress made.—E. T. CRESSON, JR., *Recorder.*

## OBITUARY.

MR. PHILIP NELL, who died at his home, 3619 North Marshall Street, Philadelphia, was elected an Associate of The Entomological Section of The Academy of Natural Sciences of Philadelphia, in 1891, and was a subscriber to this journal since its first number.

From the time he was fifteen years of age he was passionately fond of natural history, particularly the study of entomology. After making a general collection for a number of years, he took a special interest in the microlepidoptera and made a large local collection. He was noted for unusual skill in mounting these small and delicate moths. He also made excellent mounting boards, being very handy with tools and made his own boxes for the collection. For a long time he printed pin labels for those interested.

Mr. Nell was a jeweler by trade, but later was connected with the White Dental Company of this city where he was employed twenty-seven years.

He was born in Philadelphia, June 17th, 1857 and died from nephritis, after a short illness, November 7th, 1923, and was buried in Northwood cemetery.—HENRY SKINNER.

### EDGAR LEEK DICKERSON

It is with deep regret and a sense of personal loss that I record the death of my friend, Edgar Leek Dickerson, on October 30, 1923, in St. Mary's Hospital, Passaic, New Jersey, following an operation. Burial was made on November 2 in the family plot at Chester, New Jersey. He is survived by his wife, son, mother and two brothers.

Mr. Dickerson was born in Newark, New Jersey, on January 13, 1878, and graduated from the Newark High School in 1898 and from Rutgers College in 1902. According to the minutes of the executive committee of the New Jersey State Board of Agriculture for June 13, 1902, he was appointed as assistant for the summer months to Doctor John B. Smith, State Entomologist. This appointment was made permanent on May 7, 1903, according to the minutes of the committee for that date. From this time until 1911 he was closely associated with Doctor Smith and with the economic entomology of New Jersey. In the reports of the Entomological Department of the New Jersey Agricultural College Experiment Station from 1902 to 1911 frequent mention is made of Mr. Dickerson's entomological activities and duties. In 1911 he resigned and entered the biological department of the Barringer High School, Newark, New Jersey. From here he went in February, 1912, to the Central High School of Newark, where he taught until the time of his death, becoming head of the Department of Biological Sciences and Commercial Geography about 1918 or 1919.

Mr. Dickerson was an ardent collector whenever opportunity afforded and many of the Chester, New Jersey, and other records in *Insects of New Jersey* are due to Mr. Dickerson's activities. During the months of July and August from 1912 until 1915 he was employed by the New Jersey State Board of Agriculture and from 1916 to 1919 by the New Jersey State Department of Agriculture in nursery inspection work dealing both with insects and plant diseases and during this work it was my privilege to spend many pleasant days in Mr. Dickerson's company, collecting insects in various parts of New Jersey and making observations which were subsequently written up and published.

During recent years Mr. Dickerson's interest turned to the Cicadellidae and the distribution of this family in New Jersey, and most of his collecting was done in this group. It was his intention to revise the New Jersey list of these insects when enough material had accumulated and to treat them from a standpoint of geographical distribution.

During his connection with the State Board of Agriculture, he frequently spoke at Farmers' Institutes on economic insects and lectured on entomology in the Short Courses in Agriculture. In addition to his interest in entomology, Mr. Dickerson took considerable interest in civic affairs and was chairman of the Shade Tree Commission in Nutley, New Jersey, where he lived, a member of the consistory of the Franklin Reformed Church of Nutley and chairman of the building committee of the church Community House. He rarely missed a meeting of the New York Entomological Society and often presented papers and took part in the discussions. He was a member of this society for some eighteen years and secretary in 1911. At the time of his death he was a member of the Delta Upsilon Fraternity, the American Association for the Advancement of Science, American Association of Economic Entomologists, Entomological Society of America, New York Entomological Socciety, Brooklyn Entomological Society, New Jersey Microscopical Society, New Jersey Science Teachers' Association, and the Newark High School Teachers' Association. Mr. Dickerson was the author of some twenty-five papers on entomology which are listed below.

*Papers by Mr. E. L. Dickerson.*

1904. The Chinese mantis, *Tenodera sinensis* in New Jersey. Rept. Ent. Dept. N. J. Agric. Exp. Sta. pp. 585-587.
1907. The cabbage and onion maggots, with J. B. Smith. Bull. 200 N. J. Agric. Exp. Sta. pp. 1-48.
1910. Notes on *Rhynchites bicolor* Fabr. Jour. Econ. Ent. Vol. 3, pp. 316-317.
1912. The Work of Professor John B. Smith in Economic Entomology. Proc. Staten Is. Asso. Art. & Sci. Vol. IV, Parts I & II, Oct. 1911-May, 1912, pp. 17-24.
1916. Notes on *Leptoypha mutica* Say.* Ent. News XXVII, 308-310.
1916. The Ash leaf bug, *Neoborus amoenus*.* Jour. N. Y. Ent. Soc. XXIV, 302-306.
1917. *Psyllia buxi* Linn. in New Jersey.* Ent. News XXVII, 40-41.
1917. The azalea lace-bug, *Stephanitis pyrioides* Scott.* Ent. News XXVIII, 101-105.

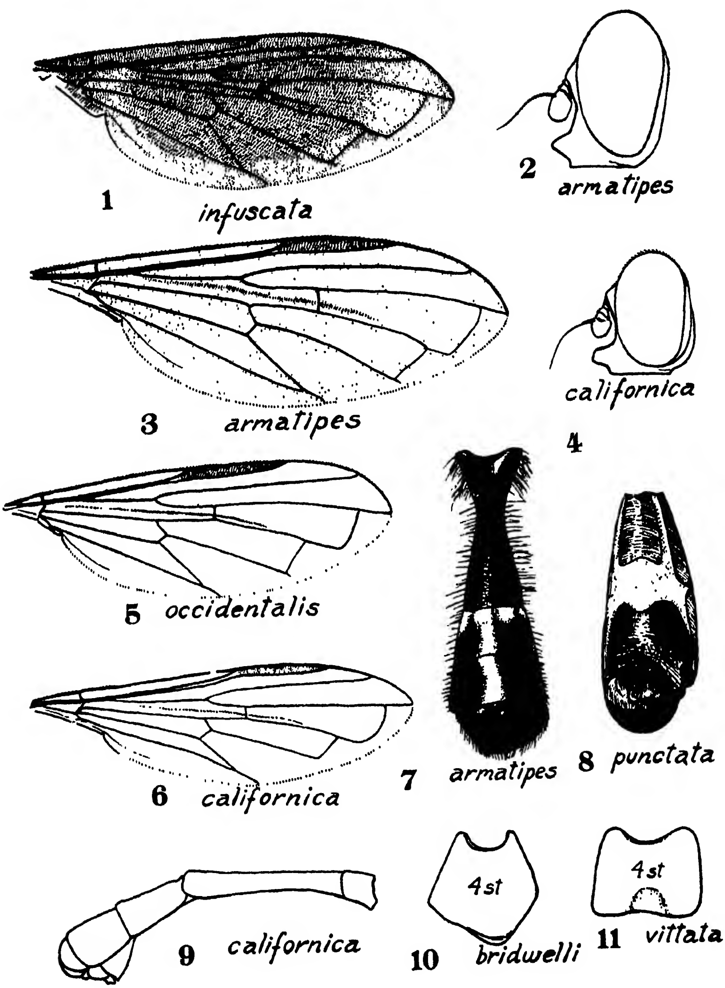
1917. Notes on *Leptobyrsa rhododendri* Horv. Jour. N. Y. Ent. Soc. XXV, 105-112.
1917. *Plagiodera versicolora* Laich, an imported poplar and willow pest.* Canad. Ent. March, 1917, 104-109.
1917. *Idiocerus scurra* Germar, a poplar leafhopper.* Jour. N. Y. Ent. Soc. XXV, 218-224.
1918. The early stages of *Corythucha pergandei* Heid.* Ent. News XXIX, 205-209.
1918. *Popillia japonica* Newm, a recently introduced Japanese pest.* Canad. Ent. Vol. L, 217-221.
1918. Notes on *Trioza alacris* Flor. in New Jersey.* Psyche XXV, 59-63.
1918. The early states of *Empoasca trifasciata* Gill.* Canad. Ent. June, 1918, p. 201-205.
1918. The life history and early stages of *Corythucha parshleyi* Gibson.* Canad. Ent. Dec., 1918, 401-406.
1918. The European mole cricket, *Gryllotalpa gryllotalpa* L., an introduced insect pest.* Jour. N. Y. Ent. Soc. XXVI, 18-23.
1918. *Corythucha spinulosa Gibson,* a new lace-bug on wild cherry.* Ent. News XXIX, pp. 121-125.
1919. The life history and early stages of *Macropsis virescens* var. *graminea* Fabr., a poplar leaf hopper in New Jersey.* Journ. Econ. Ent. XII, 437-440.
1919. Insects of the swamp rose-mallow, *Hibiscus moscheutos* L., in New Jersey.* Jour. N. Y. Ent. Soc. XXVII, 39-68.
1919. Notes on the early stages and life history of *Idiocerus cognatus* Fieb., in New Jersey.* Jour. N. Y. Ent. Soc. XXVII, 129-132.
1919. The life history and early stages of *Platymetopius hyalinus* Osb., a Japanese leaf-hopper in New Jersey.* Annals Ent. Soc. Amer. XII, 369-372.
1920. The Insects of the evening Primroses in New Jersey.* Jour. N. Y. Ent. Soc. XXVIII, 32-74.
1921. Notes on milkweed insects in New Jersey.* Jour. N. Y. Ent. Soc. XXIX, 123-145.
1921. *Gargara genistae* Fabr., a European membracid in New Jersey.* Ent. News XXXII, 108-112.

HARRY B. WEISS, New Brunswick, New Jersey.

---

* With H. B. Weiss.

Number 10, Volume XXXIV, of Entomological News, for December, 1923, was mailed at the Philadelphia Post Office, December 15, 1923.




SPECIES OF SPHEGINA.—COLE.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV    FEBRUARY, 1924    No. 2


CONTENTS



# Notes on Diptera of the Syrphid Genus Sphegina.

By F. R. COLE, Redlands, California.

(Plate I)

The writer has been collecting material in this genus for some time and this short paper will supplement the recent work by J. R. Malloch on this group. Drawings of some of the species were made in 1918 and are published at this time as an aid to the determination of the species.

In his first paper (Proc. Biol. Soc. Wash., vol. 35, pp. 141-144, 1922), Malloch adds seven species to the seven previously known from North America, and in a later paper (Ent. News, vol. 33, pp. 266-270, 1922) describes one more species and gives a table for all the species.

Verrall says of the European species that only four or five are well defined, and he doubts if anybody has ever possessed a clearly and sharply defined series of more than one species. He goes so far as to say that the whole genus might resolve it-

self into one species—*clunipes*. The writer has a few European specimens loaned by Dr. Melander, presumably determined by Strobl. The fourth sternite, genitalia and hind tibiae differ quite distinctly in *latifrons* Egger and *clunipes* Fallén. The North American species are surely distinct and no doubt structural differences can be found in European species.

The shape of the hind tibiae, the shape and armature of the fourth and fifth abdominal sternites and the structure of the male genitalia are among the most important characters used in separating species. There is some variation in the shape of the third antennal joint in different species and the antennal arista is usually characteristic. The shape of the face and the comparative width of the frons offer additional characters. The wing venation is much the same for all forms, but cell R5 is often shaped differently, vein M1+2 curving into R4+5 at different angles. Color differences need not be relied upon for separating species but they are usually constant.

The flies of this genus are not uncommon throughout the Pacific Coast region. The writer collected five species in the Hood River Valley, only one of them known to science at the time. Some of the species are among the early spring forms found in western Oregon. The blossoms of the maple have a great attraction for them and the best collecting places are more or less shaded spots, preferably near a stream of water, where one can find maples.

**Sphegina occidentalis** Malloch.

This species is quite common in some regions along the Pacific Coast and has been confused with *rufiventris* Loew, a closely allied species that probably does not occur in the western United States. I have specimens from Hood River and Rock Creek (near Corvallis) in Oregon; from Vashon, Almota, Tulalip, Quilcene, Adna and Ilwaco in Washington; also specimens from Huntington Lake, and from Mt. Home Canyon, San Bernardino County, in California. The wing is illustrated in figure 5.

**Sphegina californica** Malloch.

I have specimens from Walnut Creek, California, the type

locality, and from Hood River, Mary's Peak (near Corvallis), and Mt. Jefferson, Oregon. This is a very slender species and is illustrated by figures 4, 6, and 9.

**Sphegina armatipes** Malloch.

I have a large series taken along a small stream west of Hood River, Oregon, May 20, 1917; also one specimen from Parkdale, in the upper Hood River Valley, and one from Contra Costa County, California. Figures 2, 3, and 7 illustrate the species.

**Sphegina armatipes** var **rufa** Malloch.

Specimens from Moscow Mount, Idaho, seem to belong to this variety. Malloch recorded a male of typical *armatipes* from this same locality. Two females have the dorsum of the abdomen reddish brown. I have seen a female of this variety taken at Mary's Peak, Oregon, May (A. L. Lovett).

**Sphegina infuscata** Loew.

This widespread species has a tendency to melanism in some localities. One male from Hood River has the legs and abdomen almost entirely black, and one male from Tillamook, Oregon, March 26, 1919 (A. C. Burrill) is melanic. Two specimens loaned by Dr. Melander are melanic, one a male taken at L. Waha, Idaho, June 9, the other a female from Tacoma, Washington, May 27, the latter entirely black. The melanic forms appear to have scutellum more strongly bristled. The wing is shown in figure 1.

**Sphegina nigrimana** new species.

♂. Length 5.5 mm. Largely shining black. Third antennal joint brown, the arista yellow, short, gradually tapering and with short pubescence. Lower face and oral margin yellow, rest of head black, with some gray pollen.

Thorax, pleura and most of hind coxae shining black. Scutellum shining black, with two apical bristles not far apart. Mesonotum and upper pleura with scant gray pollen, the pile sparse and pale.

Three basal segments of abdomen (apparently two) slightly longer than the remaining segments combined. Base of fourth tergite and most of fourth sternite reddish, rest of abdomen and genitalia shining black. Posterior margin of fourth sternite straight, on the fifth broadly indented and with a half-circular membranous portion reaching back of this; no spinules on fourth and fifth sternites.

The front four legs pale yellow, pale brown near apex of front femora, the last two tarsal joints black; hind femora black except base, the tibiae transverse at apex and with two blackish rings; hind tarsi blackish, the first joint noticeably wider than the tibiae. Wings faintly infuscated, especially towards the apex; venation as in *occidentalis* Malloch (see fig. 5).

♀. Very nearly like the male. Frons broader, almost one-third the width of head. Abdomen almost entirely black, with a faint tinge of dark red on the second tergite and two faint spots on the third.

*Holotype,* male, and allotype, female, in the collection of the California Academy of Sciences, taken July 16 and 28, 1921, by E. P. Van Duzee.

*Type locality,* Huntington Lake, 7000 feet elevation, Fresno County, California.

The species is closely related to *keeniana,* but the hind tibiae in the male do not have a spur or scoop at the tip, and there are no spinules on the fifth sternite.

**Sphegina bridwelli** new species.

♂. Length 6.5 mm. A species largely yellow in color. Frons and upper occiput black, the face, cheeks and lower occiput yellow. Antennae blackish brown, arista yellow and swollen at base, quite long and distinctly pubescent. Outline of face somewhat like that of *armatipes.*

Mesonotum shining black, somewhat yellow on sides. Median portion of pleura blackish brown, humeri, coxae and metanotum yellow. Scutellum yellowish brown, darker at base, rounded at apex and with apical bristles close together.

Abdomen largely yellow, some pale brown on second, third and fourth tergites. Hypopygium black above, reddish below. Third and fourth sternites without armature, the fourth very large and produced triangularly on posterior margin (see fig. 10). Right genital style much longer than the left.

Legs yellow, with faint brown marks on middle and hind femora; apex of hind tibiae darkened, and the posterior tarsi darker brown. Hind tibiae transverse at apex, without a terminal scoop, laterally compressed on the basal half and narrowly black along the line where the tibia fits against the femur. Wings hyaline, faintly smoky at apex, the venation much as in *infuscata* but the wing shaped more like that of *occidentalis.*

*Holotype,* male, in the collection of the California Academy of Sciences, taken August 2, 1907, by J. C. Bridwell.

*Type locality,* Pamelia Lake, Mt. Jefferson, Oregon, about 3,000 feet altitude.

. The species runs to *californica* in Malloch's synoptic table, but the genitalia and fourth sternite are different and the antennal arista pubescent.

**Sphegina melanderi** new species.

♂. Length 3.8 mm. to 4.5 mm. Very nearly like *nigrimana,* but differs in having more yellow on base of hind femora, the fourth sternite smaller and only slightly excavated on the posterior margin. The third sternite is only slightly excavated on the posterior margin. The spots on third tergite are faint brownish yellow. Cell R5 is more rounded at the apex than in *nigrimana.*

♀. Very nearly like the male. Hind femora more slender than in male and all legs darker. Abdomen largely shining black; faint red spots on second tergite, larger and more distinct on the third and fourth, but without definite outline. Cell R5 more rounded at apex than in *nigrimana.*

*Holotype,* male, and allotype, female, in the collection of A. L. Melander, who took the specimens June 2, 1917 and August 16, 1910.

*Type locality,* Husum, Washington.

The allotype was taken at Quilcene, Washington, and some paratypes at Vashon and Viento in the same state. The female would run to *keeniana* in Malloch's table of species.

**Sphegina vittata** new species.

♂. Length 7 mm. Closely related to *armatipes* var. *rufa,* but paler in coloration and with different markings. Antennae brown, the arista yellow on the basal portion and finely pubescent.

Thorax and scutellum not shining black as in *armatipes,* but brownish yellow, paler on the humeri. Mesonotum with a broad median blackish brown vitta, not reaching scutellum and divided by a faint, narrow reddish line; two elongate spots, one on either side of the median line, narrowing posteriorly.

First and second abdominal segments brown with a yellowish tinge. Genital segments and styles yellow. Third and fourth sternites without spinules, the fourth large and with a median posterior portion that is unchitinized (see fig. 11).

Front legs yellow, the last two tarsal joints darker; hind femora yellow, a little darker at the tip; hind tibiae yellow with two faint brown rings, the process at apex of tibia rounded; hind trochanters without black setulae; hind tarsi dark brown. Wings faintly infuscated at tips, stigma pale brown; venation as in *armatipes*.

*Holotype,* male, in collection of California Academy of Sciences, A. L. Melander collector, May 27, 1917.

*Type locality,* Tacoma, Washington.

There is one male paratype taken at the same time and place. A female specimen taken by Dr. Melander at Glacier Station, Mt. Rainier, Washington, August 15, 1917, probably belongs here, but the mesonotum is shining black and the abdomen almost entirely yellow.

## Florida Proturans.

By H. E. Ewing, Bureau of Entomology, U. S. Department of Agriculture.

On several occasions while in the state of Florida during the months of May and June, 1922, I made a particular effort to collect specimens of the primitive order Protura. All efforts, however, except one, proved vain. But on that one occasion many specimens were obtained. While waiting for an auto to take me back to the town of Orlando, on May 26, I began to investigate an accumulation of dead leaves and other organic matter under a mammoth camphor hedge which marked the division between two citrus orchards. The leaves were rather loose and fully a foot deep on the ground. Those on or near the top were dry, but those nearest the ground were wet and considerably packed together. Among the latter, where swarmed hundreds of mites, springtails and other minute Arthropods, were found Proturans in some numbers.

The specimens then obtained have now been determined and are found to belong to three species, one of them being new. This new species, a member of the genus *Acerentomon,* is here described.

**Acerentomon floridanum,** new species.

Head about one-and-two-thirds times as long as broad. Pro-

cess of labrum (or rostrum) vestigial or wanting. Pseudoculi conspicuous, circular, dorso-lateral and situated slightly behind the middle of the head. Setae on head of moderate length.

Thorax almost twice as long as head; prothorax with upper side about twice as broad as long; mesothorax much larger than prothorax but smaller than metathorax; metathorax considerably broader than long. First two thoracic segments without tergal apodemes, but the metathorax has a short, slightly bent, unbranched, tergal apodeme that falls far short of reaching the sides of the body. First legs fully twice as long as head and when extended forward reaching beyond the latter by the full length of the tarsi and about four-fifths the length of the tibiae. Second and third legs subequal, about three-fifths as long as the first legs. Tarsus I with a long claw, straight for the first half of its length, then only slightly curved beyond. Tarsi II and III each with a much smaller claw than I and curved throughout.

Abdomen of the usual shape. Typical tergal apodemes, as represented by those on segments V and VI as follows: Gently bowed at the middle; first branch arising not far from the median line and extending laterally, forward and downward, as a tapering chitinous rod to about one-half the distance to the pleura; second branch of apodeme given off posteriorly at a distance about equal to that from the origin of the first branch to the median line; it follows an irregular course laterally and backward and may itself be branched. Eighth abdominal segment as long as ninth, tenth and eleventh taken together, and with a simple tergal apodeme that is much thickened at the middle. Vestigial abdominal appendages of the usual type.

Length of female specimen when extended to maximum, 1.3 mm.; width 0.21 mm.

*Type locality.*—Orlando, Florida.

*Type slide.*—Cat. No. 23766, U. S. N. M.

Description based on holotype, a female, and fourteen other female specimens. No males or young taken. This species is most nearly related to *A. microrhinus* Berlese, but is smaller and lacks the process of labrum, or rostrum.

The fact that only female specimens were taken would indicate that the annual reproductive cycle for these hexapods starts much earlier in Florida than in Maryland or any of the other

more northernly situated states. In Maryland only adults are taken late in the fall or winter. The males die off rapidly during the spring, and in May young individuals usually predominate over adults.

The five known species of the genus *Acerentomon* may be separated as follows:

*Key to the Known Species of Acerentomon Silvestri* (1907).

a[1]. Median process of labrum (rostrum) either vestigial or wanting .................... *A. floridanum,* new species.

a[2]. Median process of labrum (rostrum) present and not vestigial ........................................

- b[1]. Bifurcations, or branches, of tergal apodemes of abdomen indistinct and apparently lacking for most of the large abdominal segments *A. microrhinus* Berlese.
- b[2]. Bifurcations, or branches, of tergal apodemes of abdomen broad and conspicuous for most of the large abdominal segments.
  - c[1]. Total length when segments are extended to maximum but little over one millimeter; rostrum short, not over half as long as the distance between the pseudoculi ........ *A. conurus* Ewing.
  - c[2]. Total length when segments are extended to maximum considerably over one-and-one-half millimeters; rostrum long and very sharp-pointed, about as long as the distance between the pseudoculi.
    - d[1]. Seventh tergal apodeme of abdomen either unbranched, or at most seen to be indistinctly branched when viewed laterally; head, exclusive of the rostrum, not over one-and-three-fourths times as long as broad *A. doderoi* Silvestri.
    - d[2]. Seventh tergal apodeme of abdomen typical of those in front of it being broadly forked laterally and the posterior ramus thus formed being again forked; head, exclusive of the rostrum, twice as long as broad *A. americanum* Ewing.

The other two species taken in Florida are *Acerentuloides bicolor* Ewing and *Eosentomon minimum* Ewing. Of the former species, two females were collected, of the latter, one female. Again the absence of males and nymphs is noted.

# An Annotated List of the Ants of Mississippi (Hym.).

By M. R. Smith, A. and M. College, Mississippi.

The need for lists of insects common to certain localities is becoming more appreciated each day. Not only are accurate lists almost indispensable to the systematist but they are also the source of much help to the economic entomologist. This list, although not complete by any means, is being published with the idea that it will make known to some extent the characteristic ant fauna of the Gulf States; an area in which there has never been any consistent collecting for ants until recently. The ant fauna of the South Eastern and the South Western States is fairly well known, so this list will tend to bridge the intervening gap.

The genera best represented in Mississippi are *Pheidole, Crematogaster* and *Camponotus,* others such as *Myrmica, Pogonomyrmex, Tapinoma,* etc., have only one species.

Of the 76 species, subspecies and varieties recorded in this paper, 7 are imported species, namely: *Monomorium pharaonis, Tetramorium guineense, Prenolepis longicornis, Iridomyrmex humilis, Solenopsis rufa, Pheidole floridana* and *Camponotus socius.* Two of the species mentioned, *Iridomyrmex humilis* and *Monomorium pharaonis* are of considerable economic importance as house ants.

This list also includes two new species of *Colobopsis* and one new variety of *Aphaenogaster* which have recently been found in Mississippi.

The writer could enlarge this list by adding species which will no doubt be taken in the state in later years, but since there are always chances for errors in doing this, he prefers to list only the species which are definitely known to occur in Mississippi.

The species here listed, include specimens collected by the writer, those given him by friends, and specimens in the collections of the Mississippi A. and M. College. The writer particularly wishes to acknowledge here the kind assistance of Mr. Andrew Fleming, who has furnished numerous specimens and notes.

Dr. W. M. Wheeler has very kindly aided the writer by determining a number of the more difficult species. Professor R. W. Harned has offered much encouragement and been very generous in the allotment of time for such work.

## Family FORMICIDAE.

### Subfamily PONERINAE.

1.—**Ponera trigona** Mayr. var. **opacior** Forel.

A. and M. College. This uniform, brownish colored species has been taken a number of times here at the college; no doubt it occurs throughout the state. *P. opacior* nests under logs in the woods where there is plenty of moisture available. The ants are very timid and not always easy to capture.

This ant may be distinguished from the other species of the genus by the worker having her eyes located near the anterior fourth of the head; joints 3-6 of the antennal funiculi are much broader than long.

2.—**P. coarctata** Latr. subsp. **pennsylvanica** Buckley.

This ant has been reported by Mayr to occur in Mississippi, but so far the writer has not been able to take it in the state, although he has collected in various localities.

*P. pennsylvanica* is somewhat larger than the species mentioned above and may be distinguished from it by the very distinct punctation of the head and by the darker color of the body, usually black. It is a very common ant in the Northern and North-eastern States where it lives under stones, logs, or leaf mold in the woods in the presence of abundant moisture.

### Subfamily MYRMICINAE

3.—**Pseudomyrma brunnea** F. Smith.

Gulfport; Sibley; Ocean Springs. This ant has been found nesting in the twigs of white ash, *Fraxinus americana*, and in the twigs of the so-called China berry tree, *Melia Azedarach*. Very little is known concerning its habits but it is believed to feed principally on honey dew. This and the other species of *Pseudomyrma* appear to occur only in the lower part of the state.

*P. brunnea*, as its name indicates, is a brownish colored species which may be easily distinguished by its distinct coloration.

4.—**P. pallida** F. Smith.

Pascagoula; Union City; Sibley. This ant has been found to nest in the twigs of China berry trees also. It most probably nests in the stems of other trees and plants.

The writer has for some time believed that this and the following species are the same, *flavidula* being nothing more than a nest variety. Specimens from numerous nests show considerable variation in color, ranging from the pale yellow of *pallida*, without spots at the base of the abdomen, to the distinct yellow of *flavidula* which has a definite black spot on each side of the base of the abdomen. If these two species should prove to be the same, *flavidula* would become a synonym of *pallida* since the latter species was described at an earlier date.

5.—**P. flavidula** F. Smith.

Bay St. Louis; Gulfport; Sibley. Nests of this ant have been found in the twigs of China berry, pecan, swamp dogwood, white ash, etc. The habits of this species are like those of the two *Pseudomyrmae* mentioned above.

6.—**Leptothorax curvispinosus** Mayr.

A. and M. College; Fulton; Tupelo. This species usually nests in galls or twigs but has been reported to nest in decaying wood. Workers are very often seen licking up honey dew on the leaves of trees and plants. It is one of the most common species of *Leptothorax* in Mississippi.

*L. curvispinosus* is a small, yellowish ant with characteristic, long, curving, thoracic spines from which the ant gets its name. A dark spot is present near the base on each side of the first gastric segment.

7.—**L. fortinodis** Mayr.

A. and M. College; Okolona; Rara-Avis; Tupelo; Sibley. Without doubt this is the most common species of *Leptothorax* in Mississippi. The ants nest in oaks and other trees and can be found crawling up and down the trunks or entering small holes in the bark.

This species can be distinguished from the other species of *Leptothorax* here mentioned by its dark or blackish color, absence of the meso-epinotal constriction, the presence of short,

dentiform, thoracic spines and the rather prominently enlarged petiole.

8.—**L. schaumi** Roger.

A. and M. College. This pretty, yellowish red species has been taken on numerous occasions here at the College. The ants have been collected from oak logs and oak trees. Evidently this species has the same nesting habits as *L. fortinodis*.. A nest found in a niche of a dead cottonwood tree contained 31 workers, 2 queens, and a number of larvae.

*L. schaumi* is closely related to *fortinodis* in general appearance and habits. It may be separated from the latter by its yellowish red color, and its much smaller petiole. *Schaumi* like *fortinodis* has no distinct meso-epinotal constriction.

9.—**L. (Dichothorax) pergandei** Emery.

A. and M. College. This is distinctly a ground-nesting species, the workers of which may be easily confused with the workers of *Pheidole* upon superficial examination. Because the workers forage singly their nest is hard to locate.

*L. pergandei* can be distinguished from the other ants of this genus by its 12-jointed antennae, pronounced meso-epinotal constriction, and by the abundance of long white hairs covering the body.

10.—**Aphaenogaster treatae** Forel.

A. and M. College; Rara-Avis. Nests of this ant are constructed in the ground in shady places. The workers forage singly, feeding on smaller insects, etc. Because of their slender build they can run very rapidly and for that reason are exceedingly hard to capture.

The worker is easily recognized by the prominent lobe at the base of the antennal scape.

11.—**A. treatae** subsp. **harnedi** Whlr.

Caesar. This subspecies, which was named for Professor R. W. Harned, is distinguished from *treatae* by its much shorter and narrower antennal lobes and by the more opaque coloration of the thorax, petiole, post-petiole and basal half of the first gastric segment.

12.—**A. fulva** Roger.

Meehan Junction; Rara-Avis. Nests of this species are built in rotten logs in dense forests. This species does not seem to be as common in Mississippi as *treatae*.

*A. fulva* is a slender, reddish brown ant with epinotal spines which are about one half the length of the base of the epinotum.

13.—**A. mariae** Forel.

Rara-Avis. Only one specimen of this rare species has been taken in the state. *A. mariae* is thought to be parasitic on *A. fulva* and its varieties.

This species can be distinguished from any of the other *Aphaenogasters* by the base of the first gastric segment being longitudinally striated.

14.—**A. lamellidens** Mayr. var. **nigripes** Smith.

A. and M. College; Columbus. This variety has nesting habits similar to those of *A. lamellidens*.

This is a variety of the species which may be easily recognized by its distinctly dark colored legs.

15.—**Monomcrium minimum** Buckley.

A. and M. College; Greenville; Yazoo City; Sibley. This little, shining black species is very widely distributed throughout the state. It may be found nesting in the soil, trees, rotten logs, and houses. The workers feed on honey dew and on smaller insects. "The tiny black ant," as it is called, is one of the most common house-infesting species that we have in Mississippi. According to housekeepers, the ants show a preference for greasy foods, such as meat, lard, butter, etc.

16.—**M. pharaonis** Linn.

Columbus; A. and M. College. This imported species is well distributed throughout the state. Unlike *minimum*, it lives only in greenhouses, dwellings, stores, etc., and is never found nesting in the open, so far as the writer knows. It is a very common house-infesting ant.

*M. pharaonis* can be easily separated from *minimum* by its distinct, pale yellowish color. It is commonly called "the tiny red ant," or "Pharaoh's ant." There is an infuscated spot on

each side of the base of the first abdominal segment. This species bears a superficial resemblance to *Solenopsis molesta* but may be distinguished from that species by its larger size and by the fact that it possesses a three-jointed antennal club instead of a two-jointed club like *molesta*.

17.—**Trachymyrmex septentrionalis** subsp. **obscurior** var. **seminole** Whlr.

Columbus; A. and M. College. This is the only fungus-growing ant known in the state and is easily recognized by the numerous tubercules and spines on the body of the workers. Nests are constructed in sandy soils in shady locations. The nests, which are most common in the early spring months, can be identified by the crescentic shaped mass of excavated earth which is placed from a foot to a foot and a half from the entrance to the nest. Oak catkins, caterpillar excrement, etc., is used by the workers on which to cultivate the fungus and, so far as is known, the ants depend entirely on this as a source of food. Later in the year the extreme hot weather causes the ants to plug the gallery to their nests in order to prevent evaporation of the moisture, since the ants and the fungus are entirely dependent on excessive moisture for their growth and development.

18.—**Myrmica scabrinodis** subsp. **schencki,** var. **emeryana** Forel.

Rara-Avis. This is the only species of *Myrmica* known to occur in Mississippi. A number of workers were collected in a low, damp spot in the hilly northeastern section of the state.

This species can be easily recognized by its very distinct rugose head and thorax and by the exceedingly large lobes at the base of the antennal scapes.

19.—**Pogonomyrmex badius** Latr.

Lucedale; Gulfport; Laurel; Star; Clara; Ocean Springs. This ant is commonly known as "The Florida Harvester" because of the fact that the workers feed principally on seeds. It is the only species of *Pogonomyrmex* known to occur in Mississippi. The nests are fairly large mounds usually constructed

in sandy areas. The workers can sting severely and this species is without doubt our worst stinging ant. This ant seems to be confined altogether to the central and southern part of the state.

"The Florida Harvester" is a large reddish ant with heavily striated head and thorax. The epinotum is bare of spines.

20.—**Pheidole pilifera** Roger.

A. and M. College. This is not a very common ant in this locality being more strictly a northern form. Nests are built in pastures or grassy spots in fields. The workers are known to store seed in the nest for food.

Soldiers of this species have exceedingly large heads, so large that their heads are out of proportion to their bodies; this will serve to distinguish them from any of the other *Pheidoles* which occur in Mississippi. They bear a closer resemblance to *P. sitarches rufescens* than to any other species of the genus in Mississippi.

21.—**P. sitarches** subsp. **rufescens** Whlr.

A. and M. College. This is a much more common species than the one just mentioned above. *Sitarches,* although resembling *pilifera* somewhat in color and structure, lacks the exceedingly large head which is common to *pilifera.* This is also a soil nesting species, with habits similar to those of *pilifera.*

*Sitarches* is a reddish, opaque colored species with head, thorax, petiole and post petiole bearing abundant, closely set punctures.

22.—**P. morrisi** var. **vanceae** Forel.

Starkville; Sturgis. Nests of this species are always built at the base of clumps of grass, usually of the genus *Andropogon.* When the nest is disturbed, numerous workers and soldiers rush forth angrily. Occasionally they get on the collector's hands and when they nip the flesh in a tender place the bite is rather noticeable. It is by far the most courageous species of *Pheidole* in Mississippi.

The soldiers of this species can be easily recognized by the vestigial spines on the epinotum and by the presence of long, abundant hairs over all portions of the body.

23.—**P. crassicornis** Emery.

McHenry. This does not seem to be a common species in Mississippi, at least not in the eastern part of the state, where the writer has done most of the collecting. It probably nests under stones and logs and feeds on insects.

*P. crassicornis,* as its name indicates, may be distinguished from the other species of *Pheidole* in this state by the distinctly flattened antennal scapes and by the deep reddish color of the head and thorax of the soldier.

24.—**P. vinelandica** Forel.

A. and M. College; Tunica; Decatur. This is one of the smallest members of the genus in Mississippi, and one of our most common ants. Nests are constructed in the soil and the earth thrown out to form a small crater, which is about an inch in diameter. The workers feed on insects and small seeds.

Because of her small size there is no danger of confusing the soldier of *vinelandica* with the soldier of any other *Pheidole* except *floridana*. The latter species has a deeply punctate thorax which *vinelandica* does not have. *Vinelandica* has a much larger and broader head in proportion to the body and also has very prominent thoracic angles.

(To be continued)

## A New Southern Tachinid Fly (Diptera.)

By H. J. Reinhard, Texas Experiment Station,
College Station, Texas.

**Cuphocera aurifrons** n. sp.

♂. Black, grayish, pollinose, thorax and abdomen sub-shining, length 9 to 12 mm. Eyes bare. Head slightly wider than thorax, diameter at vibrissae much shorter than at base of antennae. Sides of front opaque, yellowish, pollinose, clothed with long fine erect hairs. Vitta rather obscure, yellow, narrow at vertex, widening at base of antennae. Front at narrowest point about one and one-fourth times as wide as either eye. Basal joints of antennae yellow, third brown or blackish, except on base and inner side. The latter joint broad and decidedly rounded on the front edge, at most but slightly longer than second. Arista black, rather short, thickened almost to tip, second joint elongated. All macrochaetae of head strong. Orbital bristles absent. Ocellars usually absent, but occasionally

represented by weak proclinate bristles. Inner and outer verticals equal, the inner pair strongly cruciate. Frontals in two rows on each side, diverging below and descending almost level with apex of second antennal joint. Median depression, genae, and sides of face silvery white. The latter at the lower corner of the eye bearing two macrochaetae more or less surrounded by short black hairs which extend upward to lowest frontals in an irregular row along margin of the eye. Vibrissae strong, cruciate, situated slightly above the prominent front border of oral margin. Facial ridges practically bare. Cheeks nearly four-fifths the eye height, sparsely covered with black bristles and bearing a row of macrochaetae along the oral margin. Beard dense, short and whitish in color. Proboscis moderately long, once geniculate, distal segment ridged, brownish-black, shining. Labella small, brown or yellowish. Palpi absent.

Thorax grayish, pollinose, with four distinct vittae, the inner pair narrow and becoming obsolete near middle of dorsum, the outer pair more conspicuous, broadly interrupted at the suture. Postsutural dorsocentral bristles three, sternopleurals three. Pleurae cinereous, pollinose. Scutellum gray, pollinose, yellow apically, with three pairs of long, marginal macrochaetae and a shorter, cruciate, apical pair.

Abdomen ovate, white pollinose, dorsum with reflecting spots. First three segments black, sides of second and third occasionally tinged with yellow, last segment rufous. All macrochaetae marginal, except on last segment, which bears a discal and sub-discal row.

Legs dark, thinly pollinose, coxae, knees and tibiae yellowish, bristles on the outer side of middle tibiae, unusually long. Hind tibiae not ciliate. Pulvilli tawny, front pair nearly as long as last tarsal joint, claws elongate.

Wings grayish, hyaline, costal spine obsolete. First posterior cell narrowly open, terminating far before wing tip. Veins yellow. Third vein bristly almost or quite to small crossvein, all others bare. Hind cross vein oblique, posterior end at less than one-third the distance from bend to small crossvein. Bend of fourth vein angular, with a very short stump or distinct fold. Calypteres whitish, tinged with faint yellow along the border.

♀. Similar to male differing as follows: Front distinctly wider, orbital bristles present, and the outer row of frontal bristles reduced to one or two posteriorly directed macrochaetae situated between the inner row and the orbitals. Pulvilli short.

Described from many specimens of both sexes, collected at College Station, May-November, 1917-23 (H. J. Reinhard). *Type*: Male, deposited in the U. S. National Museum.

This species probably has been confused with *fucata* v. d. W. described from Mexico. Coquillett, in his *Revision*, p. 140, referred several northern specimens here, but unfortunately none of these are available for comparison. Subsequent to the publication of his paper he added the following note, "sides of front opaque." In Biol. Cent. Amer., Vol. II, p. 476, van der Wulp described *fucata* as having front laterally shining bluish-black and third antennal joint twice as long as the second. These characters do not agree with any specimens of the series from which this species has been described.

## Notes on the False Indigo Lace Bug, Gelchossa heidemanni Osborn and Drake, in New Jersey (Hemip.: Tingitidae).

By Harry B. Weiss and Erdman West, New Brunswick, New Jersey.

Smith (*Insects of New Jersey*, p. 149) records this species under the name *Leptostyla oblonga* from several localities in New Jersey and these together with the localities listed by Barber (Circ. 54, N. J. Dept. Agric. 1922) indicate rather a wide distribution in the state. As a matter of fact the species is distributed over a large part of the United States, occurring on the false indigo *Baptisia tinctoria* L. Osborn and Drake (Ting. of Ohio. Ohio Biol. Survey Bull. 8, Vol. II, No. 4, p. 238, 1916) cite localities in Arkansas, Washington, District of Columbia, and Massachusetts. McAtee (Bull. Brook. Ent. Soc. Vol. XII, No. 3, pp. 63-64, 1917) states that it is common about Washington, D. C., and mentions also the states of Massachusetts, New Jersey and Louisiana. In the *Hemiptera of Connecticut* (p. 705) it is listed as occurring at several places. Parshley records it from several localities in Massachusetts in his *Fauna of New England, Hemiptera-Heteroptera*, (Occas. Papers Bost. Soc. Nat. His. VII). Van Duzee (Cat. Hem.

Amer. No. Mex. p. 218, 1917) gives its distribution as Massachusetts, Pennsylvania, District of Columbia, Maryland and Arkansas.

Nothing appears to have been recorded concerning its life history and the following notes relating to observations made mainly at Monmouth Junction but also at South Amboy, Hornerstown, Prospertown, Lahaway and High Bridge, New Jersey, supply some of this information. In the central portion of New Jersey overwintering adults appear about the last week of May and persist in more or less plentiful numbers until about the middle of June. As a rule the adults inhabit the lower surfaces of the leaves and do noticeable feeding, causing white areas to appear on the upper surfaces. Eggs are deposited during the last of May and first part of June and the young nymphs become plentiful about the middle of June. By the last of June and first week of July many last stage nymphs are in evidence and adults issue shortly afterwards, becoming numerous from the beginning of the second week of July until the end of the month. There is apparently only one brood and the adults gradually disappear during August.

The eggs are deposited singly, or in irregular groups of two or three, in the lower tissue of the leaf either near or away from the midrib. Each egg is embedded well in the tissue with the long axis of the leaf parallel with the leaf surface and with only the truncated, oval end of the neck of the egg visible as it projects slightly beyond or remains flush with the leaf surface. These oval ends resemble stomata somewhat and are similar in color to the leaf. After hatching the young nymphs appear to feed close to the midrib, assuming a position as a rule, parallel to this part of the leaf. As they become older they feed in colonies of 10 or 12 on the lower surface, although many leaves may contain more and some only 1 or 2 nymphs. Usually both adult and nymphal feeding is well scattered over the plant. In severe infestations, which often occur, every leaf is white and hundreds of whitish nymphs and adults inhabit each plant. Such a condition existed at Prospertown, N. J., on July 18, when hundreds of adults and a very few last stage nymphs were

observed on the whitened plants. Five nymphal stages were observed and the following descriptions indicate the changes which take place in the development of the insect from egg to adult.

*Egg.* Length 0.39 mm. Width 0.1 mm. Smooth, yellowish-white, translucent, somewhat cylindrical, flask-shaped with the broad neck-like portion bent to one side. Truncate end of neck-like part suboval, opposite end broadly rounded with diameter slightly less than that of middle portion of egg.

*First Stage Nymph.* Width of head including eyes 0.1 mm. Length about 0.45 mm. White or white slightly tinged with yellow. Subrectangular, pointed at anterior and posterior ends. Antennae slender, 4-jointed, as long or almost as long as body. Eyes lateral, red, consisting of 5 distinct ommatidia. Head, thorax and abdomen subequal in width. Prothorax twice as long as mesothorax; remainder of thoracic and abdominal segments subequal in length. Legs long, whitish. Sheath of rostrum reaching to between the third pair of legs. Armature similar to that of the third stage. Triangular group of three spines on the head, the two spines on the posterior margin of the head and the single median, dorsal, abdominal spines quite pronounced; remainder minute.

*Second Stage Nymph.* Width of head including eyes 0.15 mm. Length about 0.72 mm. Shape suboval or elliptical. Whitish except for large spines which are brownish. Antennae, eyes, legs, etc., similar to those of preceding stage. Tip of rostrum reaching to between the third pair of legs. Spines minute, similar in position to those of the third stage; the pair on the posterior margin of the head and the single, median, dorsal spines on abdominal segments 2, 5, 6 and 8 being comparatively long and prominent.

*Third Stage Nymph.* Width of head including eyes 0.2 mm. Length about 0.95 mm. Shape elongate-oval or elliptical, sides subparallel, converging acutely anteriorly and posteriorly. Whitish except for portions of legs, pair of spines on head and long, median dorsal spines on abdomen which are brownish. Antennae slender, 4-jointed, almost as long as body, third joint longer than other three combined. Eyes lateral, prominent, red, consisting of several ommatidia. Head sub-globular. Prothorax wider than head, subrectangular in shape and about as long as mesothorax. Mesothorax subrectangular, slightly wider than prothorax. Metathorax about one-half as long as mesothorax. Head bearing three rather prominent, median spines, arranged triangularly, also a median pair of long spines on the posterior

edge. Prothorax with two pairs of small, median, dorsal spines, one pair posterior to the other and a single spine on each lateral edge. Mesothorax with pair of median, dorsal spines and a single spine on each lateral edge. Metathorax with a minute pair of median, dorsal spines. First abdominal segment with a minute pair of median, dorsal spines. Second abdominal segment with a single, prominent, median, dorsal spine. Abdominal segments 5, 6 and 8 each with a rather prominent single, median, dorsal spine. Single lateral spines on abdominal segments 1 to 9, those on segments 1 to 3 being minute and the remainder quite pronounced. Each spine arising from a tuberculate base and bearing a minute hair at or near tip. Tip of rostrum reaching to between the third pair of legs. Legs comparatively long.

*Fourth Stage Nymph.* Width of head including eyes 0.25 mm. Length about 1.4 mm. Similar in shape and color to preceding stage. Spines more pronounced. Armature similar to that of preceding stage except that lateral spines are absent from the first abdominal segment. Wing pads of mesothorax suboval, extending laterally slightly beyond edges of mesothorax and posteriorly to or slightly beyond the first abdominal segment. Tip of rostrum extending to between second pair of legs.

*Fifth Stage Nymph.* Width of head including eyes 0.3 mm. Length about 1.8 mm. Color white except as noted. Shape elongate-oval or subelliptical. Antennae almost as long as body, light brown, sparsely hairy, hairs minute; 4-jointed, third joint longer than the other three combined. Eyes prominent, lateral, red, consisting of numerous ommatidia. Head subglobular, bearing a minute tubercle between the base of each antenna and eye, also three rather prominent, median spines arranged triangularly and a pair of prominent spines on median portion of posterior margin.

Prothorax somewhat shield-shaped, anterior margin transverse, sides projecting outward slightly, posterior margin ending in an obtusely angled point; anterior margin bearing a pair of small median spines which are white; prothorax bearing a pair of dorsal, median spines and one spine at each posterior, lateral angle. Lateral edges of prothorax bearing minute hairs or spine-like hairs. Mesothorax partly covered by posterior projection of prothorax and bearing a pair of prominent, median, dorsal spines on posterior edge. Wing pads of mesothorax elongate, narrow, projecting back to fifth abdominal segment. Wing pads of metathorax slightly longer. Mesothoracic wing pad bears a prominent spine on lateral edge about beginning of posterior third; anterior to this spine along the lateral edge are

several spine-like hairs. Metathorax with a dorsal, median pair of greatly reduced white spines or tubercles.

Lateral edges of abdomen slightly margined, anal segment tubular. First abdominal segment bears a pair of median, dorsal, greatly reduced spines or tubercles. Prominent median, dorsal spines on abdominal segments 2, 5, 6, 7 and 8, the one on the seventh segment sometimes being absent. Single spines on posterior lateral edges of abdominal segments 4, 5, 6, 7, 8 and 9. All spines on body dark or dark-tipped except the two, median, dorsal, prothoracic pairs, and the lateral, abdominal spines on segments 4 to 8, which are white. Sometimes the median, dorsal spine on the fifth abdominal segment is white. All spines except lateral, abdominal ones are directed vertically or nearly so. Legs long whitish or slightly browned, bearing a few minute hairs. Tip of rostrum reaching almost to between the second and third pair of legs. Minute spines present on lateral edges of abdominal segments 2 and 3 which were present in stage four are missing in stage 5.

*Adult.* This was described by Osborn and Drake in 1916 (Ohio Biol. Survey Bull. 8, Vol. II, No. 4, p. 238) and need not be repeated here. Van Duzee in his *Catalogue of the Hemiptera of America North of Mexico* places *heidemanni* O. & D., as a synonym of *Leptostyla clitoriae* Heid., but both are distinct species. Moreover the eggs of *clitoriae* as described by Heidemann (Proc. Ent. Soc. Wash. XIII, p. 137) are ovate, black and deposited upright on the under leaf surface of *Clitoria mariana*, whereas the eggs of *heidemanni* are of a different shape and embedded in the leaf tissue of *Baptisia tinctoria*. Parshley in the *Hemiptera of Connecticut* (P. 705) and McAtee (Bull. Brook. Ent. Soc. Vol. XII, No. 3, pp. 63-64, 1917) state that Mr. Heidemann's cabinet name for the species was *L. affinis* and Parshley further states that the species has usually been referred to as *oblonga* Say. Drake (Mem. Carn. Mus. Vol. IX, No. 2, p. 372, 1922) writes that the genus *Leptostyla* was first established in 1864 by Paolo Lioy for a genus of *Muscidae* (*Diptera*) and has priority over *Leptostyla* Stål, 1873 (Hemiptera). This was recognized by Kirkaldy in 1904 (Entom. XXXVII, p. 280) who proposed the name *Gelchossa*.

# Undescribed Crane-Flies from Argentina (Dipt.: Tipulidae). Part VIII.

By CHARLES P. ALEXANDER, Amherst, Massachusetts.

The four new species of *Dicranomyia* described at this time were collected in the Province of Córdoba by Dr. Bruch, and in the Province of Jujuy by Engineer Weiser, to both of whom I am greatly indebted for numerous specimens of Argentinian Tipulidae. The types are preserved in the writer's collection through the kindness of the collectors.

**Dicranomyia flavofascialis** sp. n.

Antennae with the scalpal segments obscure brownish yellow, the flagellum dark brown; head with a grayish yellow bloom; mesonotum dark reddish brown, the praescutum with three, brownish black stripes; scutal lobes brownish black; pleura largely dark brown; femora with the tips broadly yellow and with a more or less distinct subapical brown ring; wings yellowish subhyaline; stigma and indistinct seams along the cord and outer end of cell $1stM_2$ darker; vein *Sc* short; abdomen dark brown, the segments ringed caudally with yellowish.

♂. Length 8.2-8.5 mm.; wing 9.4-10 mm. ♀. Length 8.5-10.5 mm.; wing 8.5-11.5 mm.

Rostrum and palpi dark brown. Antennae with the scapal segments obscure brownish yellow; flagellar segments oval, dark brown. Head dark with a greyish yellow bloom; vertex between eyes narrow.

Mesonotal praescutum dark reddish brown with three, brownish black stripes, the median stripe broad, becoming indistinct before the suture; scutum pale medially, the lobes brownish black; scutellum yellowish medially, the lateral margins brownish black; postnotum dark brown, the lateral margins narrowly obscure yellow. Pleura dark brown, the dorsal margin of the sternopleurite more yellowish; remainder of sternopleurite dark brown. Halteres pale brown, the knobs and distal half of the stem brown.

Legs with the coxae obscure yellow, the outer faces more or less darkened; trochanters dull yellow; femora pale brown with the tips broadly and conspicuously light yellow, preceded by a dark brown ring; tibiae and tarsi brown.

Wings yellowish subhyaline; stigma suboval, brown; narrow and very indistinct seams along the cord and outer end of cell *1st M2*; veins dark brown. Venation: *Sc* short, ending opposite or slightly before the origin of *Rs*, *Sc2* a short distance

from the tip, *Sc*1 alone being about equal to the outer deflection of *M3*; *Rs* about one-half longer than the deflection of *R*4+5; cell *1st M2* closed; basal deflection of *Cu*1 at the fork of *M* or nearly so.

Abdominal tergites dark brown, the posterior margins of the segments conspicuously and broadly ringed with dull yellow; sternites obscure yellowish brown, similarly ringed with yellow.

*Holotype*: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920, (C. Bruch). *Allotopotype*: ♀. *Paratopotypes*: 30 ♂ ♀.

*Dicranomyia flavofascialis* is closely related to *D. andicola* (Alexander) but is readily told by the darker coloration of the thorax and abdomen, the less distinct brown pattern on the wings, and the subterminal brown ring on the femora.

**Dicranomyia patruelis** sp. n.

Antennae dark brown, the first scapal segment obscure brownish yellow; flagellar segments oval; head light brown; mesonotum obscure yellow, the praescutum with three, broad, dark brown stripes; scutellum dark brown with a pale median line; halteres long and slender; legs uniformly brown; wings yellowish subhyaline, the stigma pale brownish yellow; *Sc* short, cell *1st M2* closed; abdominal tergites uniformly dark brown.

♂. Length 8 mm.; wing 9 mm. ♀. Length 9 mm.; wing 10 mm.

Rostrum and palpi dark brown, the former elongate. Antennae with the basal segment obscure brownish yellow, the remainder of the organ dark brown, the flagellar segments oval. Head light brown, somewhat narrowed behind.

Pronotum long and narrow, dark brown above, paler laterally. Mesonotal praescutum shiny obscure yellow with a broad, dark brown, median stripe that becomes bifid and obliterated shortly before the suture; lateral stripes not well indicated; scutum whitish, each lobe dark brown; scutellum dark brown, with a capillary pale median vitta; postnotum dark brown, paler laterally. Halteres long and slender, dark brown, the base of the stem paler.

Legs with the coxae obscure yellow, the fore coxae darker; trochanters obscure yellow; femora light brown; remainder of the legs darker brown.

Wings yellowish subhyaline, the stigma very pale brownish yellow; veins brown. Venation: *Sc*1 ending just before the origin of *Rs*, *Sc2* some distance before this tip, *Sc*1 alone being a little longer than the basal deflection of *M*1+2; *Rs* about one-

third longer than the deflection of $R4+5$; tip of $R1$ beyond $r$ indistinct; cell *1st M2* closed, subrectangular; basal deflection of $Cu1$ much shorter than $Cu2$, placed just beyond the fork of $M$.

Abdominal tergites uniformly dark brown; sternites uniformly obscure brownish yellow, the terminal segments a little darker.

*Holotype*: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920, (C. Bruch). *Allotopotype*: ♀.

*Dicranomyia patruelis* is closely allied to *D. flavofascialis* but is readily told by the uniform femora and abdomen, the subhyaline wings with the stigma pale, and the different coloration of the body.

**Dicranomyia globulicornis** sp. n.

Antennae uniformly dark brown, the basal flagellar segments subglobular; head grayish brown, the orbits clearer gray; mesonotum yellowish buff, the praescutum with four, narrow, brownish gray stripes, the scutellum and postnotum whitish, pruinose; legs brown; wings hyaline, highly iridescent; stigma pale brown; $Sc$ short, $Sc2$ far before the tip of $Sc1$; cell *1st M2* closed; abdominal segments uniformly brown.

♂. Length about 5.8 mm.; wing 6.5-6.8 mm.

Rostrum and palpi dark brown; rostrum slightly produced. Antennae dark brown throughout, the basal five or six segments of the flagellum nearly globular, the succeeding segments passing into oval, the terminal segments elongate. Head grayish brown, the orbits broadly paler gray; head strongly narrowed behind; vertex between eyes wide.

Pronotum large, dark brown medially, paler laterally. Mesonotal praescutum yellowish buff with four, narrow, brownish gray stripes, the intermediate pair narrowly separated and not attaining the suture; scutum pale grayish white medially, the centers of the lobes dark brownish gray; scutellum and postnotum pale, covered with a sparse white bloom. Pleura pale reddish yellow, covered with a sparse white bloom. Halteres short, pale, the knobs indistinctly darker.

Legs with the coxae shiny reddish brown; trochanters obscure yellow; femora pale brownish yellow; remainder of the legs brown.

Wings hyaline, highly iridescent; stigma pale brown; veins brown. Venation: $Sc$ short, $Sc1$ ending before the origin of $Rs$, the distance about equal to $m$; $Sc2$ far from the tip of $Sc1$, the latter vein alone thus being very long, only a little shorter than $Rs$ and a little longer than the deflection of $R4+5$; cell *1st M2*

closed; *m* about two-thirds the outer deflection of *M3*; basal deflection of *Cu1* longer than *Cu2*, placed at or before the fork of *M*.

Abdomen uniformly brown, the tergites a little darker colored.

*Holotype*: ♂, Tilcara, Province of Jujuy, March 20, 1920, (V. Weiser). *Paratopotype*: ♂.

**Dicranomyia jujuyensis** sp. n.

Mesonotal praescutum with an obscure yellow median stripe, the posterior half of the sclerite with four, narrow, dark brown stripes; scutal lobes with a dark brown ring; halteres yellow, the knobs dark brown; wings subhyaline, with a heavy reticulate pattern; *Sc* long, cell *1st M2* closed; abdomen uniformly reddish brown.

♂. Length 4.8 mm.; wing 5.8 mm.

The unique type is not fully matured. Rostrum relatively long and slender, brown, sparsely pollinose; palpi dark brown. Antennae with the first segment brown, the second segment and basal segments of the flagellum paler, distal flagellar segments brown. Head with a sparse, grayish yellow pollen, the center of the vertex with a brown mark.

Pronotum pale, sparsely pollinose. Mesonotal praescutum with a broad, median, obscure yellow stripe, the posterior half broadly margined with dark brown, the mesal margin of the usual lateral stripes similarly dark brown, the interspaces silvery white, pruinose; lateral margins of the sclerites obscure yellow; scutum silvery white, each lobe obscure yellow, encircled by a broad, dark brown marking; scutellum silvery; postnotum obscure yellow, sparsely pollinose. Pleura brownish yellow. Halteres yellow, the knobs dark brown.

Legs long and slender, the coxae and trochanters yellow; remainder of the legs not fully colored, apparently to become dark brown with the femoral tips paler.

Wings subhyaline with a conspicuous reticulate brown pattern, the heavier areas being at the origin of *Rs*, before midlength of cells *Sc* and *R*; near midlength of *M*; a conspicuous stigmal area that extends onto the deflection of *R4+5*; a large, conspicuous area occupying the outer end of cell *2nd R1*, the centers of cells *R3* and *R5*; all the other cells of the wing with conspicuous spots, clouds and transverse bars; costa yellow with about 22 subequal dark brown marks alternating with yellow areas that are usually much wider; remaining veins pale brown. Venation: *Sc* long, *Sc1* ending beyond midlength of the long *Rs*, *Sc2* at the tip of *Sc1*; *r* at the tip of *R1*; *Rs* long, square and spurred at origin; cell *1st M2* closed; outer deflec-

tion of *M*3 about twice the length of *m;* basal deflection of *Cu*1 before the fork of *M*, the distance being about equal to *r-m*.

Abdomen reddish brown, possibly darker when fully colored.

*Holotype*: ♂, Tilcara, Province of Jujuy, March 20, 1920, (V. Weiser).

In its reticulate wing-pattern, *D. jujuyensis* bears a certain resemblance to *D. reticulata* (Alexander) of Cuba and Southern Florida, but is readily told by the long subcosta and the details of coloration.

## Color Preference of Bees (Hymen.).

Lately there has come a statement that bees are largely given to visiting blue, purple or violet flowers, although not totally ignoring yellow or red ones. Bees are heterotropic. They have become diversified along with the entomophilous flora. Of 437 local flowers whose visitors were observed, 96.2 per cent are visited by bees. There are only three on which I am sure bees never occur. The colors of the local flora are red (all dark colors) 29.4 per cent, yellow 30.7, white 39.8. Of the flowers observed 30.2 per cent are red, 30.6 yellow, 39.1 white, showing a little discrimination in favor of red flowers. The flowers visited by bees show red 28.7 per cent, yellow 31.1, white 40.0. Of 6063 bee visits 23.1 per cent are to red, 33.5 to yellow, 43.2 to white. The flowers visited and visits made are about what might be expected without regard to color. The determining condition is the situation of the nectar, which is most accessible in white flowers and the least in red ones. Of local bees only 70 (23.6 per cent) are largely given to visiting red flowers. Of their visits, 45.9 per cent are to red, of the visits of 96 other species, 52.9 per cent are to yellow, while of the visits of the remaining 130 species, 55.9 per cent are to white.

When a statement about bee visits is made, one would like to know the percentages of red in the flora referred to, in the flowers observed and in the visits recorded. In the Alps 57.1 per cent of the bee visits were to red flowers, but these were about 48 per cent of the flowers observed, and the visits of insects of all classes showed 41.6 per cent under that color. In the Berlin Garden 55.4 per cent of bee visits were to red, but such flowers were 48.2 per cent of the flowers observed, indicating that they had been selected.

The general statement criticized here would be more correct if applied to hawk-moths or to butterflies.—Charles Robertson, Carlinville, Illinois.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., FEBRUARY, 1924.

## Entomology at the Convocation Week Meetings, December 27, 1923 to January 2, 1924.

The meetings of the American Association for the Advancement of Science and of Associated Scientific Societies were held at Cincinnati, Ohio, on the dates mentioned above. The occasion was the Seventy-fifth Anniversary of the A. A. A. S., the third of its meetings in the "Queen City of the West."

Papers relating, in whole or in part, to the tracheate Arthropods were listed on the programs of the following seven organizations, a smaller number of societies than were represented on the list for last year (see the NEWS for February, 1923, page 55).

| | |
|---|---|
| American Society of Zoologists (alone) | 9 |
| The same with the Ecological Society of America | 3 |
| The same with the Botanical Society of America (joint Genetics Section) | 6 |
| Entomological Society of America | 70 |
| American Association of Economic Entomologists (including its sections on Apiculture and Horticultural Inspection | 89 |
| American Phytopathological Society | 1 |
| Ecological Society of America (alone) | 1 |
| A. A. A. S. Section N, Medical Sciences | 1 |
| Total | 180 |

The 180 papers were concerned with the following subjects:

| | | | |
|---|---|---|---|
| Cytology | 1 | Insecticides and Fumigants | 24 |
| Anatomy | 7 | Apiculture | 14 |
| Histology | 1 | Araneina | 2 |
| Physiology | 11 | Acarina | 4 |
| Ontogeny | 4 | Orthoptera | 6 |
| Genetics | 6 | Ephemerida | 1 |
| Geographical Distribution | 4 | Odonata | 1 |
| Taxonomy | 2 | Mallophaga | 1 |
| Ecology | 48 | Anoplura | 2 |
| Parasites of Insects | 7 | Neuroptera | 1 |
| Relations to Man | 2 | Homoptera | 17 |
| General Economic Entomology | 26 | Heteroptera | 12 |
| | | Thysanoptera | 2 |
| Insects Injurious to Plants | 20 | Coleoptera | 16 |

| | | | |
|---|---|---|---|
| Hymenoptera (excluding *Apis*) | 11 | Diptera (excluding *Drosophila*) | 9 |
| *Apis* | 6 | *Drosophila* | 6 |
| Trichoptera | 1 | Siphonaptera | 1 |
| Lepidoptera | 14 | | |

Many of these figures are duplicated; thus the papers on *Drosophila* appear also under Genetics.

The large number of papers credited to Ecology is due to the extensive symposium of the Entomological Society of America on "Methods of Protection and Defense Among Insects," divided into five parts: *a* Protective Structures; *b* Protective Constructions; *c* Protective Size, Form and Color; *d* Protective Positions, and *e* Protective Behavior or Reactions, and listing 41 separate papers and authors. To it also is partly due the highest total (180 papers) yet presented at a Convocation Week.

The American Association of Economic Entomologists had two symposia: one on "Methods of Estimating Insect Abundance and Damage" (8 speakers listed); the other on the "European Corn Borer" (9 speakers listed).

The Ecological Society of America had a symposium on "Ohio Ecology," including one paper on Insects (Odonata, Prof. C. H. Kennedy).

The annual address before the Entomological Society was by Prof. James G. Needham, of Cornell University on "The Rôle of Insects in Food Production." The Presidential address to Economic Entomologists was by Mr. A. G. Ruggles, State Entomologist of Minnesota, on "Pioneering in Economic Entomology."

It is a matter of regret that none of the Editors of the NEWS were able to be present at Cincinnati, but, thanks to the kindness of Dr. Annette F. Braun, we are able to add a statement of the numbers participating in the sessions. Dr. Braun writes:

The following figures will give an idea of the attendance at the Entomological meetings in Cincinnati.

Entomological Society of America. Thursday afternoon session, December 27, 92; Friday morning, December 28, 125*; Friday afternoon, December 28, 178*: Saturday morning, De-

cember 29, 95; Saturday afternoon, 50-75; Saturday evening, 125.

The figures marked * approximate the number of different persons present at some time during the session; not all were present at one time. In the Friday afternoon session, there were about 150 in the room at the same time throughout the session.

The Economic Entomologists had an average attendance of about 175. About 200 were present at one time or another.

The total registration at Cincinnati nearly equalled that of the 1920 meeting in Chicago.

### Notes on Corythucha marmorata Uhler in New Jersey (Hemip.: Tingitidae).

Since Dr. Felt's account of this species, in the *19th Report of the State Entomologist of New York* (N. Y. St. Mus. Bul. 76, P. 125, 1903), practically nothing has appeared concerning its life history and the following notes are intended as supplemental. At Mendham, New Jersey, on July 24, the species was noted as being very abundant and injurious to wild asters. Eggs, all nymphal stages and adults were present and the leaves of the plants were so injured that they were almost white, many of them being withered from the attacks of the nymphs. Eggs were observed in the tissue of the undersides of the leaves close to the mid and side ribs and sometimes in the tissue of the ribs. They were laid in irregular, elongate masses parallel to the ribs, some of the masses being made up of from 4 to 75 eggs placed with little or no regularity. Some leaves contained as many as 150 eggs. As a rule only the cap of the egg projected above the leaf tissue, but in a few cases the eggs appeared to have been carelessly laid and fully one half was exposed. The location of the eggs could be detected readily by reason of the brown, varnish-like excrement which was placed over them, the streaks of this material being quite pronounced along the mid-ribs. Eggs were noted in leaves badly injured by nymphal feeding as well as in uninjured leaves. The nymphs feed in colonies on the lower leaf surfaces, the newly hatched ones always being found close to the eggs from which they hatched. Colonies numbering from 6 to 100 individuals were noted and in quite a few instances, an adult female was near each colony of nymphs. The eggs and early stages were described by Dr. Felt and since his paper, the species has been mentioned often in systematic literature and faunal lists. —Harry B. Weiss & Ralph B. Lott, New Brunswick, N. J.

## Note on the mating of Anopheles maculipennis (Dipt.; Culicidae).

While on a visit in Holland the mating of *A. maculipennis* was observed during several evenings. The observations were made in Gelderland, not far from the Rhine, in the middle of June and on the days of July 3 to 8 inclusive.

After a period of cold, with rainy days, the weather improved and the temperature increased. On June 16 at 8.45 P. M. a small swarm of *A. maculipennis* males were seen hovering at the windward side of some lilac bushes. Three pairs of copulating anopheles* were kept under observation for 20 to 35 seconds until they separated.

On July 3, at 8.30 P. M. a number of small swarms of males of *A. maculipennis* were noticed on the windward side of some small pear trees. The swarms were composed of from 50 to 100 individuals. The movements of the insects were free and varied, circling upward and downward, back and forth, with their heads against a gentle breeze. The movements were often very irregular, individuals leaving the swarms and returning after a few seconds. Suddenly a female was seen entering the swarm causing a decided disturbance. The males were excited and made an extreme high singing sound.

In the course of 6 successive evenings swarm formation was observed. The formation of columns started about 7.30 P. M. and ended about 9.15-9.30 P. M. (Sun set 8.30-8.45). A few males would gather and as time went on others joined and took part in the dancing. It was repeatedly seen that a female entered the swarm, caught a male and flew away copulating end to end. In every case the female led off and dragged the male behind, flew for a short time and separated. The time of union lasted from 30 to 55 seconds. The temperature on these evenings ranged from 64 to 67° F. One copulating pair was seen to fly to a resting place at the edge of the thatched roof of the farm house about 5 feet above the ground. The united pair rested quietly for about 30 seconds, when the male flew away and the female shortly afterwards.

It was interesting to notice that swarms started to form first and hovered on the windward side of English walnut trees, then on the windward side of pear and apple trees, while only once a small swarm was observed at the end of a branch of linden trees. On the edges of the large walnut trees from 20 to 30 small swarms were counted. It is the common belief that English walnut trees are a protection against mosquitoes.

* One pair caught while copulating was determined by Dr. L. O. Howard a few days later as *A. maculipennis*, while others were determined later.

Swarming was much more pronounced near the dwelling than near the chicken pen or empty stable. The nearest pigsty was about 300 yards away. In the proximity of these pigsties swarming and mating took place during the same evenings, although in apparent smaller numbers.—WILLEM RUDOLFS, Biochemist in Entomology, New Jersey Agricultural Experiment Stations, New Brunswick, N. J.

---

## A Gynandromorph of Odynerus conformis Sauss. (Hymenoptera, Aculeata).

On August 21st, 1923, while collecting at Glen Echo, Md., I captured a gynandromorph of *Odynerus* (*Stenodynerus*) *conformis* Sauss. The right antenna is male, and the left female, but the clypeus is colored as in the females on the right side, being yellow only on the upper third and the apical tooth is longer than on the left side which is entirely yellow as in typical males of this species. The yellow spot between the bases of the antennae reaches only midway to base of antenna on the right side while it extends to the base on left side, another reversal of color similar to that on clypeus. On the right side the mid and hind coxae are pale yellow in front, while on the left side they are entirely black; the pale spots are characteristic of the male. The mid femur is yellow on anterior side from base to apex on right side (male), and yellow only on apical third on left side (female). The left fore tarsus is noticeably broader than the right one and the left fore wing is 1 mm. longer than the right one (7:8 mm.), the right side evincing male characters. The genital organs are those of a typical female. The specimen was specifically identified by Mr. S. A. Rohwer.—J. R. MALLOCH, Washington, D. C.

---

## An Hermaphrodite Hesperid (Lepid.: Rhop.).

Among some Hesperiidae collected by the author at Oakdale, Long Island, New York, on July 1, 1923, was a somewhat worn specimen of *Polites manataaqua* Scudder combining the characters of both sexes of this species. The specimen is of the size of the normal female and of the general brownish color of that sex; on the right primary is a distinct stigma corresponding to that found in the male, of the same shape and length but slightly narrower and is followed on its outer border by the usual dark patch of scales; the two spots found below the end of the cell are present in both primaries but in the right primary the lower and normally larger, subquadrate spot of the female is greatly reduced, being about half as wide as that of the left primary and corresponding to the form of this spot in the male; the upper subtriangular spot is of the same size in

both primaries and about normal; the left primary is rounded on its outer margin as in the normal female, but the right primary has the outer margin straighter and at a point opposite the upper end of the stigma is curved slightly inward and then straight up to the apex, which is nearly as pointed as in the male.

There is a narrow ray of tawny scales in the cell of both primaries, extending from the base of the cell for about two-thirds the length; the ray in the cell of the right primary is slightly wider for its entire length than that of the left primary; this ray is not present in any of the normal female specimens in my collection, though occasionally a female is found with a small tawny spot in the cell near the end, and seems to indicate in this specimen the tawny area usually found in the normal male.

The general appearance of the under surface of both wings is about as in the normal female except that there is a complete absence of the band of spots usually found on the secondaries.—E. L. BELL, Flushing, New York.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **13**—Journal of Entomology and Zoology, Claremont, Cal. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **16**—The Lepidopterist, Salem, Mass. **19**—Bulletin of the Brooklyn Entomological Society. **30**—Tijdschrift voor Entomologie, The Hague, Holland. **39**—The Florida Entomologist, Gainesville, Florida. **54**—Proceedings of the Biological Society of Washington, D. C. **68**—Science, Garrison on the Hudson, N. Y. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **82**—The Ohio Journal of Science, Columbus, Ohio. **85**—The Journal of Experimental Zoology, Philadelphia. **119**—Proceedings of the National Academy of Sciences of the U. S.

A., Washington, D. C. **132**—Revista do Museu Paulista, Sao Paulo, Brazil. **147**—Archiv fur Mikroskopische Anatomie und Entwicklungsmechanik, Berlin. **153**—Zeitschrift fur angewandte entomologie. Herausg. von K. Escherich, Berlin.

**GENERAL. Baker, A. W.**—Diamond jubilee meeting of the entomological society of Ontario, 1923. **4,** lv, 293-4. **Buxton, P. A.**—Two further cases of co-ordinated rhythm in insects. **9,** 1923, 271-3. **Janische, E.**—Ueber alterserscheinungen bei insekten und ihre bekampfungsphysiologische bedeutung. **118,** 1923, 929-31. **Rothschild, N. C.**—Obituary. **8,** 1923, 279-80. **9,** 1923, 284-6. **Searle, J.**—Medium for mounting small insects. (Vict. Nat., xl, 140.) **Stoner, D.**—On the abundance of tropical terrestrial arthropods. **19,** xviii, 162-3. **de la Torre-Bueno, J. R.**—The crumbs of Dives (editorial). **19,** xviii, 170-1.

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC. Ferry, Lancefield, & Metz.**—Additional mutant characters in Drosophila willistoni. (Jour. Heredity, xiv, 373-84.)

**ARACHNIDA AND MYRIOPODA. Levy, R.**—Sur le mecanisme de l'hemolyse par le venin de scolopendre. **69,** clxxvii, 1326-8. **Stekhoven, J. H. S.**—Zur biologie der kratzmilben. (Verh. Kon. Akad. V. Weenns. te. Amsterdam., xxi, No. 2.)

**Bryant, E. B.**—Report on the spiders collected by the Barbados-Antigua expedition. . . (Univ. Iowa Stud., x, No. 3, 10-18.) **Chamberlin, R. V.**—A new cryptodesmoid milliped from Santo Domingo. **54,** xxvi, 189-90. **Ewing, H. E.**—The generic and specific name of the orange rust mite. **39,** vii, 21-2. **Leitac, M.**—Theraphosoideas do Brasil. Arachnideos da ilha dos Alcatrazes. **132,** xiii, 5-438; 515-25. **Oudemans, A. C.**—Studie over de sedert 1877 ontworpen systemen der Acari; nieuwe classificate; phylogenetische beschouwingen. **30,** lxvi, 49-85.

**THE SMALLER ORDERS OF INSECTA. Cleveland, L. R.**—Symbiosis between termites and their intestinal protozoa. **119,** ix, 424-8. **van Heurn, W. C.**—Over een waarschijnliike parasiet (Thripoctenus brui) en een vermoedelijke hyperparasiet van Thrips tabaci. **30,** lxvi, 119-28.

**Navas, P. L.**—Algunos insectos del Brasil. **132,** xiii, 767-74. **Priesner, H.**—Ein beitrag zur kenntnis der Thysanopteren Surinams. **30,** lxvi, 88-111.

**HEMIPTERA.** **Dingler, M.**—Beitrage zur kenntnis von Lecanium hesperidum, besonders seiner biologie. **153,** ix, 191-246. **Funkhouser, W. D.**—New host for Membracidae. **19,** xviii, 156. **Marcovitch, S.**—Plant lice and light exposure. **68,** lviii, 537-8. **Olsen, C. E.**—Distributional notes on Hemiptera. **19,** xviii, 163-4.

**Barber, H. G.**—Report on certain families of Hemiptera-heteroptera collected by the Barbados-Antigua expedition. . . (Univ. Iowa Stud., x, No. 3, 17-29.) ***Dodds, C. T.**—A new salt marsh mealy bug. **13,** xv, 57-60. **Hempel, A.**—Hemipteros novos ou pouco conhecidos da familia Aleyrodidae. **132,** xiii, 1119-91. **Porter, C. E.**—Insecto nuevo de la fam. Berytidae. (Rev. Chile. Hist. Nat., xxvii, 20-1.) **de la Torre-Bueno, J. R.**—Report on the Aquatic Hemiptera collected by the Barbados Antigua expedition. . . . (Univ. Iowa Stud., x, No. 3, 30-8.) ***de la Torre-Bueno, J. R.**—A saldid genus new to the U. S. and new sps., with notes on other water bugs from the Adirondacks. **19,** xviii, 149-54.

**LEPIDOPTERA.** **Bell, E. L.**—Notes on Calpodes ethlius. (Rhopalocera.) Polygonia progne on Long Island. **19,** xviii, 154; 164-5. **Chittenden, F. H.**—Note on Ogdoconta cinereola. **19,** xviii, 155-6. **Hutchings, C. B.**—A note on the monarch or milkweed butterfly with special reference to its migratory habits (Can. Field-Nat., xxxvii, 150). **Jurriaanse, J. H.**—Some remarks about the supposed scent-organs of the genus Opsiphanes. **30,** lxvi, 147-51.

***Barnes & Benjamin.**—The change of a preoccupied name. Notes on the types of two recently described aberrations of Basilarchia archippus. **16,** iv. 17; 29-30. ***Cassino & Swett.**—New geometrids. Some new Eupithecias. **16,** iv, 18-24; 25-9. **Coolidge, K. R.**—California butterfly notes. **19,** xviii, 159-61. **Kaye, W. J.**—A striking new lycaenid from St. Vincent, B. W. I. **9,** 1923, 277. **Schaus, W.**—New sps. of American Geometridae in the U. S. N. M. **15,** xi, 149-67.

**DIPTERA.** **Brelje, R.**—Ein fall von zwitterbildung bei Aedes meigenanus. **147,** c, 315-343. **Freeborn, S. B.**—The range overlapping of Anopheles maculipennis and A. quadrimaculatus. **19,** xviii, 157-8. **Glaser, R. W.**—The effect of food on longevity and reproduction in flies. **85,** xxxviii, 383-412. **Jacobson, E.**—Micro-dipteren als ectoparasiten enderer insekten. **30,** lxvi, 135-6.

**Bonne, C.**—The male hypopygium of Chagasia farjardi and the systematic position of this sp. The male hypopygium of Anópheles mediopunctatus. The eggs of A. mediopunctatus. **30**, lxvii, 112-14; 115-17; 118. **Borgmeier, T.**—Una nova especie termitophila de Dohrniphora. . . . **132**, xiii, 1213-24. ***Curran, C. H.**—New cyclorrhaphous diptera from Canada. **4**, lv, 271-9. **Dyar, H. G.**—The mosquitoes of Panama. A new Culex from Mexico. On some of the American subgenera of Culex. **15**, xi, 167-86; 186-7; 187-90. ***Hull, F. M.**—Notes on the family Syrphidae with the description of a n. sp. **82**, xxiii, 295-8.

**COLEOPTERA. Bernet Kempers, K. J. W.**—Iets naar aanleiding van d'Orchymonts "Apercu de la nervation alaire des coleopteres." **30**, lxvi, 129-34. **Campbell, R. E.**—Notes on the life-history of Dinapate wrightii. **13**, xv, 61-5.

**Barber, H. S.**—A remarkable wingless glow-worm from Ecuador. **15**, xi, 191-4. **Bondar, G.**—Notas biologicas sobre alguns buprestideos brasileiros do genro Colobogaster. **132**, xiii, 1265-76. ***Frost, C. A.**—New sps. of Buprestidae from the U. S. **4**, lv, 279-81. **Melzer, J.**—Longicorneos novos, ou pouco conhecidos, do Brasil. **132**, xiii, 529-33. **Obenberger, J.**—Eine serie neuer Buprestidenarten. **30**, lxvi, 1-32.

**HYMENOPTERA. Bequaert, J.**—Ants accidently introduced into New York and New Jersey; and a correction. Neopasites and Polyergus at White Plains, New York. **19**, xviii, 165; 171. **Savin, W. M.**—A wasp that hunts cicadas. (Nat. Hist., xxii, 569-75.)

**Fattig, P. W.**—The bumble-bees of Florida. **39**, vii, 25. **Santschi, F.**—Description de quelques nouvelles fourmis du Brasil. **132**, xiii, 1253-64. **Wheeler, W. M.**—Report on the ants collected by the Barbados-Antigua expedition. (Univ. Iowa Stud., x, No. 3, 3-9.)

## SPECIAL NOTICES.

**Lepidoptera: Some new Coenocharis.** This is the title of a paper in The Lepidopterist of which the author is not given. Two new species from the western states are described.

**The Mystery of the Hive,** by E. Evrard, translated from the French by B. Miall. New York, Dodd Meade & Co., 1923, 369 pp. This book will be found of interest to

the general reader who cares for nature and her children; wherein he will find out all about the home life of the honey-bee. The concords and discords of the bee family are told here in a very readable and understandable manner. Price, $2.50.

---

NINETEENTH REPORT, STATE ENTOMOLOGIST OF MINNESOTA to the Governor. By A. G. RUGGLES, St. Paul, Minn. Published Nov. 1, 1923. 151 pp., 3 pls. This latest addition to a well and favorably known series covers the two years ending December 1, 1922. Mr. Ruggles discusses the principal insect problems of the biennium, naming 13 insects, or groups of insects, which attracted special attention for their economic importance (pp. 3-9) and, in conjunction with J. R. Eyer, gives Preliminary Notes on the Life History and Control of the Potato Leaf Hopper, *Empoasca mali* Le B. (pp. 10-14). S. A. Graham gives the results of investigations on the Red Turpentine Beetle (*Dendroctonus* valens Le C.) in Itasca Park, Minn. (pp. 15-21) and an interesting summary of his studies on the Effect of Physical Factors in the Ecology of certain Insects in Logs (pp. 22-40). His experiments "have shown conclusively that the activities of wood-boring insects are controlled very decidedly by the action of external factors and that the zone of their optimum development is often very narrow. [Thus] on the upper side of logs [in the open] are found only insects which are most resistant to heat, such as Chrysobothris. . . . . Under three-quarters shade. . . . no Chrysobothris was present." The economic value of such researches is evident. Paul M. Gilmer contributes an informing paper on Derris as an insecticide (pp. 41-49). H. H. Knight has some valuable Studies on the Life History and Biology of Perillus bioculatus including observations on the nature of the color pattern (pp. 50-96, 3 pls.) C. E. Mickel furnishes Preliminary Notes on the Mutillidae of Minnesota with descriptions of three new species (pp. 97-113) and O. W. Oestlund A Synoptical Key to the Aphididae of Minnesota (pp. 114-151), a revision of his Synopsis of 1887, accompanied by a phylogenetic tree of the tribes.—P. P. CALVERT.

---

REPORTS ON CERTAIN ARTHROPODS . . . . OF THE BARBADOES-ANTIGUA EXPEDITION of 1918. University of Iowa Studies in Natural History, X, No. 3. Iowa City, Aug. 1, 1923.—These reports are on the Ants by Prof. W. M. Wheeler, the Spiders by Elizabeth B. Bryant, Certain Families of Hemiptera-Heter-

optera (Coreidae, Pyrrhocoridae, Lygaeidae, Reduviidae Tingidae) by H. G. Barber, and on the Aquatic Hemiptera (6 families) by J. R. de la Torre-Bueno. The last three reports are, so far as these two islands are concerned, based entirely on the material collected by the University of Iowa Expedition. Prof. Wheeler has included Barbados and Antigua records derived from other sources in a list of 26 forms, including one new variety. Twenty-nine species of spiders (six new), 24 species of terrestrial Heteroptera (1 Reduviid new) and 10 species of aquatic Heteroptera (1 Corixid, 1 Belostomid new) are listed from these two islands. No generalizations on geographical distribution are contained in any of these four reports, but Mr. de la Torre-Bueno exposes the unsatisfactory condition of the taxonomy of the aquatic Hemiptera.—P. P. CALVERT.

## OBITUARY.

The Hon. NATHANIEL CHARLES ROTHSCHILD, who died October 12, 1923, was a wealthy banker, who from boyhood had a keen love for all nature. He elected to make a special study of a somewhat neglected field in Entomology which has become of the greatest importance to humanity, in relation to the transmission of epidemic and endemic, high mortality diseases. He took up the study of the Ectoparasites, particularly Siphonaptera. He did splendid work on these interesting insects and in conjunction with Dr. Karl Jordan, published more than 138 articles. There are now known nearly 700 species of fleas and in 1880 only about 33 were recorded. Mr. Rothschild always took a great interest in the Lepidoptera, and had a collection. He paid particular attention to the biological aspect of these insects. His splendid collection of Siphonaptera, with ten thousand pounds, he willed to The British Museum. He took a great interest in places of historic value or natural beauty and was an advocate and patron in this line of endeavor. Full articles on the life work of Mr. Rothschild will be found in the British entomological journals. The writer wishes to pay tribute to the memory of the gentleman, who was a handsome man, modest, able, kindly and generous, and the news of his death was learned with sincere sorrow and keen regret.—HENRY SKINNER.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV MARCH, 1924 No. 3

CONTENTS



## An Annotated List of the Ants of Mississippi (Hym.).

By M. R. SMITH, A. and M. College, Mississippi.

(Continued from page 54.)

25.—**P. dentata** Mayr.

Tupelo; Aberdeen; A. and M. College; Sturgis. Next to *vinelandica* this is one of the most common species of *Pheidole* in Mississippi. Unlike the former species, *dentata* seems to prefer building its nests under stones, logs, planks, etc. The soldiers and workers probably feed almost entirely on insects.

*P. dentata* is considerably larger than *vinelandica* and possesses more rounded thoracic angles. The specimens examined by the writer have two spines on their gular borders, while those of *vinelandica* are bare of spines. The presence, or absence of spines should not be relied upon entirely, however, in the determination of the species of *Pheidole*.

26.—**P. dentata var. commutata** Mayr.

Sibley. The writer has not taken this variety in the state but on different occasions has received specimens from Mr.

Andrew Fleming of Sibley. Mr. Fleming found this variety nesting in a post resting on the gallery floor of his house. The workers were noticed carrying a small beetle and a leaf hopper into the nest; they would also carry flies and sugar into the nest when these were placed near the nest's entrance. Mr. Fleming thinks that the ants do most of their foraging at night, for very few ants were seen during the day and these appeared quite timid, almost frantic, if disturbed.

This variety is a much more smooth and shining ant than *dentata*. The posterior portion of the head, the prothorax, gaster and legs are very noticeably shining. The specimens sent to the writer are very dark brown, almost black. Dr. Wheeler states that there is considerable variation in the color of *commutata*.

27.—**P. tysoni** Forel.

Sibley. This is also a soil-nesting species which does not seem to be common in the state.

The soldiers of this species can be distinguished by their distinctly elongated heads, the sides of which are sub-parallel. The gular border contains two prominent spines which can be easily seen in profile.

28.—**P. flavens** Roger subsp. **floridana** Emery.

Ocean Springs. This is a tropical species which has become established in the state.

29.—**P. metallescens** var. **splendidula** Whlr.

Gulfport. This is another soil-nesting species of *Pheidole*. According to Dr. Wheeler nests are built in the sand in more or less grassy places.

The beautiful violaceous, or metallic colored workers of this species at once distinguish it from the other *Pheidole* that occur in Mississippi.

30.—**Solenopsis geminata** Fabr.

"The fire ant" as it is commonly called, because of its fire-like sting, is one of the most common ants in the state. It is often complained of as a house pest, the workers showing a decided fondness for greasy foods. Nests are built in the soil in open, sunny places and the particles of earth thrown out in a more or less loose mass which is characteristic of this species.

When the nest is disturbed the workers rush forth in a very vicious manner and will sting the intruder who dares put his hand or feet near them. The fire ant is a very important predator of the boll weevil because of its habit of entering the squares and feeding on the immature young of the weevil. In literature it is reported as eating into ripening strawberries and other small fruits of this type.

This ant is rather variable in color, the smaller workers being much darker than the larger workers. The head of the larger workers is reddish while the thorax, petiole, abdomen and appendages are darker.

31.—**S. geminata** var. **xyloni** McCook.

This is a color variety of *geminata*. The workers are much darker than those of the species. *Xyloni* has habits similar to *geminata*.

32.—**S. geminata** subsp. **rufa** Jerdon.

Tupelo. This is an imported ant which has been found in only one locality in the state. Nests were found under concrete sidewalks. The workers were noticed crawling here and there on the sidewalk in search of food.

This subspecies may be distinguished from *geminata* by the presence of a tooth on each side of the thorax between the prosternum and the mesosternum, the tooth extending backward and downard.

33.—**S. molesta** Say.

This tiny yellow species is well known in the literature of economic entomology. It is very often a troublesome house pest. It has been reported to attack the germinating seed of small cereals in Kansas. *Molesta* seems to have a very varied food habit, feeding on insects, seeds, human eatables, etc. It occasionally lives in the nest of other ants, stealing the larvae and pupae for food. This is the smallest ant mentioned in this paper.

34.—**Cremastogaster ashmeadi** Mayr.

A. and M. College; West Point. This little species nests in the twigs of trees or in galls. It feeds on the honey dew excreted by plant lice.

*A. ashmeadi* may be distinguished from the other *Cremastogaster* occurring in this state by its unusually small size and by the short, blunt, incurved spines on the epinotum of the worker.

35.—**C. lineolata** Say.

This common North American ant undoubtedly occurs throughout the state. It nests in the ground under stones, in rotten logs, etc. It is also very fond of honey dew. The workers when disturbed turn up their abdomens in such a manner as to earn for themselves the title of acrobatic ants. *Lineolata* is more closely related to *atkinsoni* than to any of the other ants mentioned here.

36.—**C. laeviuscula** Mayr.

This species is very commonly found crawling up and down the trunks of trees or over logs on the ground. The workers are exceedingly fond of honey dew but no doubt feed on insects, etc. Wheeler states that he has found *laeviuscula* nesting in the galls of the Cynipid, *Holcaspis cinerosus,* on oak in Texas.

*Laeviuscula* may be recognized by the uniform smoothness of the body; the head, thorax and pedicel are shining and very finely punctate above. The epinotal spines are rather long, acute and diverging.

37.—**C. laeviuscula** var. **clara** Mayr.

The variety *clara* is a larger ant than *laeviuscula.* It has similar food and nesting habits.

It may be distinguished from the other species of the genus by the bright yellowish red color of the head, thorax, pedicel, and appendages of the worker. The abdomen is black, usually with a slight tinge of red at the base. The spines on the epinotum are longer, more curved and acute than those of *laeviuscula.*

38.—**C. atkinsoni** Wheeler.

A. and M. College. This species builds large paper-like nests which resemble very much those of the white-faced hornet, *Vespa maculata.* For a long time this species was confused with *C. lineolata;* recently Wheeler has published an article pointing out the differences between the two species. It is a smaller and more slender ant than the typical *lineolata* and has a smoother, and more shining thorax. The epinotal spines are also straighter and more acute than in the former.

39.—**C. victima** subsp. **missouriensis** Pergande.

A. and M. College; Sibley. Nests are built in the soil, usually in a clay or a clay loam. Small particles of earth are thrown out of the nest's entrance to form a small crater. The ants when unearthed are slow of movement and appear blinded by the light. Nothing is known concerning their food habits.

This species can be recognized by its pale, yellowish color; the gaster is slightly infuscated at the tip. It is the smallest of the species of *Cremastogaster* found in this state.

40.—**Tetramorium guineense** Fabr.

Gulfport; Biloxi; Pascagoula. This is the only species of *Tetramorium* known to be present in the state, although the writer has been expecting to find *caespitum* also. This imported ant is very common in the localities mentioned above, where it may be found crawling up and down trees in search of honey dew. Like *caespitum,* it is a house-infesting ant.

This is a reddish yellow ant with dark colored gaster. It can be easily distinguished from *caespitum* by the distinct rugosity of the head and thorax, the former species having this portion of the body striated.

41.—**Dolichoderus (Hypoclinea) mariae** Forel.

A. and M. College; Columbus. This beautiful red and black species constructs its nest in the soil at the base of broom straw grass, *Andropogon* sp., or more occasionally about the roots of small bushes. The colonies are very large, consisting of thousands of individuals. Not only are the ants fond of honey dew but they also like insect food. The workers have a habit of crawling up and down tree trunks in files.

The workers are easily distinguished from the other species of *Dolichoderus* by their color, size, and smooth, shining surface of the body.

42.—**D. (Hypoclinea) taschenbergi** Mayr.

Rara-Avis; A. and M. College. The shining, black workers of this species are easily recognized. Nests are built in situations similar to those of *mariae,* the habits of the two species being about the same. A large nest found at A. and M. College on

May 5, 1922, contained thousands of workers, and numerous males and immature forms.

This species is about the same size as *mariae* but is easily distinguished from that species by its black color. It is also smooth and shining.

43.—**D. (Hypoclinea) plagiatus** subsp. **pustulatus** Mayr.

Okolona. This species has habits similar to those mentioned above, the colonies, however, are not so large, consisting only of a few hundred individuals.

The workers are smaller than those of *mariae* or *taschenbergi*. The head is almost black, the thorax reddish brown and the base of the gaster is spotted with yellow.

44.—**Dorymyrmex pyramicus** Roger.

Macon, Columbus, Aberdeen, Laurel, Sibley. The "lion ant," as it is commonly called, builds its crater-shaped nests in sunny spots. The workers are very fond of honey dew, but also feed on small insects. Sexed forms have been found in the nests as early as April and the writer is led to conclude from this that the queens take their nuptial flights early in the spring. The workers when crushed have the peculiar rotten cocoanut-like odor, which is so common to many of the species of Dolichoderinid ants. This species and its varieties are often found nesting together.

This ant can be distinguished by its slender form, its dark color, and by the conical shaped epinotum of the worker.

45.—**D. pyramicus** var. **niger** Pergande.

Macon; Sibley; McHenry. This is a very dark form of *pyramicus* with similar nesting, and other habits. It seems to be more common to the lower part of the state.

46.—**D. pyramicus** var. **flavus** Pergande.

Tupelo; Gulfport; A. and M. College; Newton. This is a distinct yellow variety of the species, which also has similar nesting habits. *Flavus* is a more common variety than *niger* in this state.

47.—**Tapinoma sessile** Say.

Artesia; Clarksdale. This species nests in logs, also in the

soil under planks, stones, etc. The workers when crushed have the peculiar odor so characteristic of this, and related species. *T. sessile* does not seem to be a common ant in Mississippi, at least the writer has not found it so. The workers bear some resemblance to the Argentine ant and might be taken for that species by the ordinary layman, but the presence of the distinct odor in *sessile* is evidence enough to distinguish the two.

This ant varies considerably in size and color but is usually a very dark brown with a pruinose tinge. The petiole is vestigial, another characteristic which readily separates it from the Argentine ant.

48.—**Iridomyrmex pruinosus** Roger.

Pascagoula. Several workers of this species were taken at the above named locality.

49.—**I. pruinosus** var. **analis** Andre.

This is probably the most common ant found in the state. Nests are constructed in the soil and the earth very often piled up at the entrance to form a small crater. The workers are exceedingly fond of sweets and, not only attend plant lice, scale insects, etc., but often wander into houses in search of food. This is the nearest relative of the Argentine ant and is often confused with it. The presence of a distinct odor readily separates it from the Argentine ant. It may be told also from this species by the pale, yellowish white color of the abdomen, that of the Argentine ant being a uniform dark brown.

50.—**I. pruinosus** var. **humilis** Mayr.

This imported species, commonly known as the Argentine ant, is by far the worst house-infesting ant that we have in the state. At present, about seventy towns in Mississippi are known to be infested with it and there are, no doubt, many others of which we have no record. The workers have a habit of getting into every conceivable place, especially where food is stored. They have been known to crawl over a chunk of ice in a refrigerator in order to reach meat. They also drive setting hens from the nest, thus making chicken raising in some towns practically impossible. The greatest damage from the Argentine ant is

caused, no doubt, through its pernicious habit of spreading scale insects, plant lice, mealy bugs, etc. Last year the state spent about $25,000 in fighting this pest. Campaigns of control were conducted in seventeen of the infested towns. Once these ants become established in a town they drive, or kill out all of the native ants, with the exception of a few small species with which they live amicably. The spread of this species is, for the greater part, accomplished by man through the channels of commerce. The Plant Board has, on numerous occasions, intercepted these ants in nursery shipments from infested to non-infested places.

This ant can be distinguished from its nearest relatives by the absence of an odor, by the rather slender appearance, the uniform brownish color, and by the absence of a sting.

51.—**Eciton (Acmatus) schmitti** Emery.

A. and M. College; Natchez; Starkville, Toomsuba. This is perhaps the commonest *Eciton* in the state. The workers have vestigial eyes and are more or less blind, probably depending on their sense of smell for guidance. The ants are seldom seen on the surface of the ground. They are fond of fleshy foods and, as far as the writer is aware, are never seen in attendance on any honey dew-excreting forms of insects. A female of this species was plowed up by a correspondent at Toomsuba.

*E. schmitti* can be distinguished from its nearest relatives by the opaque, reddish brown head, thorax, petiole and postpetiole, which are also punctate and foveolate.

52.—**E. (Acmatus) opacithorax** Emery.

Sibley. This species has been taken but once in the state, altho it will probably be found later to occur throughout the state. The ants seem to show a fondness for nesting in wood, the writer having taken them from beneath the bark of a pine log in North Carolina. Mr. Fleming has also found them nesting in the base of a stump at Sibley. The food habits of *schmitti* and *opacithorax* are the same.

*Opacithorax,* as its name indicates, can easily be distinguished from the other *Ecitons* by its opaque thorax. The head, abdomen and appendages are smooth and shining. This is a light, yellowish red species.

53.—**E. (Acmatus) pilosus** F. Smith.

Sibley; Hazlehurst. This does not seem to be a very common species in Mississippi. Mr. Fleming, who took specimens at Sibley, wrote the writer as follows concerning them: "I saw several colonies moving the same day. The colonies are evidently very large, one moving along a path leading to my yard formed a solid colmun, ⅜ to ½ inch broad and about 150 feet long: it then separated into two lines going a little to the right and left of the original column. I could see the two branches for about 25 feet. I do not know how long they were in going, but in places they left a distinct trail where they had passed along. I did not see where they came from or where they went." Mr. Fleming also sent the writer a species of ant, which some of the workers of *pilosus* were carrying in their mouths; the ant, on determination, proved to be *Cremastogaster ashmeadi.* Wheeler mentions that the *Ecitons* are fond of the larvae and pupae of other ants and will forage their nests. This may explain what was taking place when Mr. Fleming observed them. In January, 1915, a correspondent at Hazlehurst sent in a number of specimens of *pilosus* which he claimed were getting into his well and decomposing, thus causing the water to have a foul odor.

(To be continued.)

## Some Apparently New Heteroptera from Florida.

By W. S. Blatchley, Indianapolis, Indiana.

During the past two years the writer has had in preparation a work on the Heteroptera of the Eastern United States. While thus engaged a number of apparently undescribed forms have been found among the Florida material in his private collection. As it will be two years or more before the main work is ready for the press, it is thought best to publish the descriptions of five of these at the present time. The types of all are in the private collection of the writer.

**Geotomus cavicollis** sp. nov.

Broadly oval, subdepressed. Head, pronotum, scutellum and under surface black, shining; hind margin of pronotum and corium piceous; membrane dull whitish- to fuscous-hyaline;

antennae, beak, tibiae and tarsi reddish-brown; femora piceous.

Head slightly wider across the eyes than long, its front margin broadly rounded, thickened and reflexed, but without bristles or teeth within the margin; cheeks vaguely, transversely rugose, sparsely, irregularly, rather finely punctate. Antennae with joints 2 and 3 subequal in length, the former more slender and almost nude, 5 slightly longer than 4, 3—5 thickly pilose with stiff suberect hairs. Beak reaching middle coxae.

Pronotum wider than long, its front margin broadly concave, bordered within by a regular row of rather coarse punctures; side margins feebly sinuate; disk with a large, broad, rather deep, impunctate concavity on middle of apical half, on each side of this sparsely and coarsely punctate, the punctures extending along the sides behind the concavity to basal third. Submargins of head and pronotum with a few scattered erect bristly hairs. Scutellum with a submarginal row of fine punctures and a few coarser scattered ones on apical half. Corium with four irregular rows of punctures, the inner row nearly entire, the others abbreviated; clavus with a single row of punctures.

Genital plate of male deeply concave above, its apex broadly rounded. Length 5-6 mm.

Arch Creek and Dunedin, Florida, March 1-21. Taken by sifting dead leaves and beneath cover along the margins of wet hammocks. Not being able to determine from literature the first examples taken, they were submitted to both E. P. Van Duzee and H. G. Barber. The former called it *Pangaeus* sp. ?, the latter at first thought it was *Aethus indentatus* Uhler with the submarginal bristles of front of head abraded. However, the finding of additional specimens without bristles on head proved that it is not an *Aethus*. Mr. Barber later compared it with all specimens in the Uhler and National Museum Collections, finding it very distinct from *A. indentatus* Uhl. He found no named specimens like it; but among the unidentified material there was a single specimen from Paradise Key, Fla., and another from Alabama, and he has one in his own collection from North Carolina. This species forms a sort of connecting link between the genera *Pangaeus* and *Geotomus*. In size and general facies it more closely resembles the former but the preapical impressed line of pronotum, which is the primary

distinguishing character of *Pangaeus,* is represented only by a row of coarse punctures. It is much larger than our other known species of *Geotomus* and the sculpture of the upper surface is very different from them, but in all generic keys of literature it runs to *Geotomus,* and is therefore described as a member of that genus. *Type* a male taken at Dunedin, Florida, March 4, 1921.

**Podops peninsularis** sp. nov.

Oblong-oval, small for the genus. Above dull grayish-brown, tinged with fuscous; head and front portion of pronotum thinly clothed with prostrate yellow pubescence; punctures of pronotum and scutellum each enclosing a minute yellow scale; first four joints of antennae reddish-brown tinged with fuscous, last joint piceous, pubescent; under surface uniform piceous, the punctures each with a yellow prostrate scale-like hair; legs fuscous or piceous, annulate with dull yellow.

Head as in *dubius,* the cheeks just equalling or scarcely exceeding the tylus, the convex portion of latter shorter. Joints 2-4 of antennae subequal, fifth fusiform, longer and stouter. Beak as described in *bb* of accompanying key, scarcely reaching middle coxae.

Pronotum with median transverse groove less distinct than in *dubius,* the disk behind it strongly convex, rather coarsely and thickly punctate, the tooth or projection of front angles much smaller than in *dubius,* not exceeding the eye, subtriangular, its tip subacute; sinus in front of humeral projection less deep. Scutellum much as in *dubius,* the posterior impression scarcely evident.

Abdomen much more thickly and finely punctate. Male genital segment semicircular, with a deep curved median impression, the basal portion thickly coarsely punctate, the apical one broadly and deeply concave with slightly projecting apical angles. For other characters see the key. Length 5-5.5 mm.; width, 3.2-3.5 mm.

Described from two males and four females taken at Dunedin, Florida, December 24—March 4, from beneath boards and among grass roots on the margins of ponds. Our smallest species, resembling a miniature *dubius* but very distinct by the characters given in the key and description. *Type* a male taken at Dunedin, Fla., February 21, 1921.

Four species of *Podops* are now known from the Eastern

United States. These may be readily separated by the following

*Key to Species of Podops.*

a. Tooth or projection near humeral angle of pronotum very prominent subcylindrical, surpassing the humerus by a distance equal to length of eye, its apex and front edge curved; margin of pronotum in front of humeral tooth deeply sinuate or concave.

*b*. Lobe or tooth at front angle of pronotum very large, surpassing the eye by one-third or more of its length, its apex obtuse; beak reaching or slightly surpassing the hind coxae, it second and third joints subequal, each one-half longer than fourth; femora wholly piceous-black; length 7-9 mm. *dubius* (P. B.)

*bb*. Tooth at front angle of pronotum much smaller, not surpassing eye, its apex subacute; beak scarcely reaching middle coxae, its second joint nearly as long as third and fourth united; femora annulated with paler; much smaller, not over 5.5 mm. *peninsularis* sp. nov.

*aa*. Tooth near humeral angle of pronotum much less prominent, but slightly surpassing the humerus, subtriangular, its apex obtuse or subacute; margin of pronotum in front of tooth feebly sinuate or straight.

*c*. Larger, 6-6.5 mm.; middle of abdomen sparsely, irregularly punctate; margin of pronotum between apical and humeral projections, distinctly not deeply sinuate; outer apical angles of male genital plate produced and visible from above beyond the apex of scutellum. *cinctipes* (Say.)

*cc*. Smaller, not over 5.5 mm.; abdomen deeply and uniformly punctate throughout; margin of pronotum between the projections straight; outer apical angles of male genital plate short, obtuse, not visible from above. *parvulus* Van D.

**Mezira novella** sp. nov.

Elongate-oblong. Dark reddish-brown, under surface and dorsum of connexivum paler; membrane fuscous with a vague pale spot at base.

Head as long as wide across the eyes; tylus almost reaching apex of first antennal; antenniferous spines small, triangular, acute; vertex coarsely unevenly granulated, the impressions very small; postocular tubercles distinct, obtuse; antennae stout, distinctly shorter than head and pronotum united, joints 2 and 4 subequal in length, 3 two-thirds longer than either.

Pronotum subtrapezoidal, sides distinctly not deeply sinuate near middle, margins finely reflexed, median transverse impression evident, ill-defined, disk with front portion bearing four oval or lozenge-shaped low but distinct tubercles, hind portion finely and densely granulated. Scutellum triangular, much narrower than in *granulata,* the apex more acute; disk with a transverse smooth elevation at base, this divided at middle by a distinct longitudinal median ridge which extends to apex.

Abdomen narrow, the sides parallel. Ventral segments with the usual ridge lying just within the spiracles very faint. Genital segment of male subtriangular, obtuse behind, carinate and subimpressed each side above, lobes narrow, very small. Length 4.5-4.8 mm.

Cape Sable, Florida, February 25-28; a dozen or more specimens beneath bark of decaying limbs in dense hammocks. Smaller and paler than *granulata,* with sculpture of scutellum very different. Pronotum with side margins narrower, much less deeply sinuate, their apical lobe less pronounced; front portion of disk with tubercles more distinct, hind portion much more finely and densely granulated. *Type,* a male from Cape Sable, Florida, February 25, 1919.

**Ptochiomera (Carpilis) barberi** sp. nov.

Oblong-oval. Head, pronotum, base of scutellum and under surface dark reddish-brown; elytra, nodulose hind angles of pronotum and apical half of scutellum in part, pale brownish-yellow, their punctures but slightly darker; antennae reddish-brown, the base of second joint paler; legs and beak pale yellow.

Antennae relatively stout, as long as head and pronotum united; first joint stout, subcylindrical, exceeding tip of tylus by half its length; second subclavate, twice the length of fourth three times that of third; the third joint and apical half of second as stout as fourth.

Brachypterous form with pronotum subcylindrical, front lobe scarcely wider and three times as long as hind one, minutely punctate, its sides straight, very feebly converging from base to apex; hind lobe with hind angles strongly nodulose, rather

coarsely rugosely punctate. Scutellum sparsely punctate, the preapical median carina very fine. Elytra obovate, the corium and clavus scarcely differentiated; membrane absent; corium reaching fifth dorsal, its hind margin obliquely truncate.

Front femora strongly swollen, armed beneath with two rows of fine subequal teeth; front tibiae of males strongly curved, armed beneath at apical fifth with an acute tooth. Length 2.8-3 mm.

Dunedin and Cape Sable, Florida, January 26-February 23. Described from two brachypterous males taken from beneath boards on the bay beaches. *Type,* a male from Dunedin, Florida, January 26, 1921. Named in honor of H. G. Barber, of Roselle, New Jersey, our leading American authority on the Lygaeidae. The cotype is in his collection. The form of pronotum and antennal segments and the dark hue of hind lobe of pronotum easily distinguish this from *ferruginea* Stål. These two species represent in the United States the genus *Carpilis* of Stål, erected in 1874, with *ferruginea* as the type. They differ from our other *Ptochiomera* in having the antennae shorter with the last three joints furnished with stiff erect hairs, in the toothed front tibiae of males and in the front lobe of pronotum being more than twice the length of hind one. These characters are, in my opinion, of sufficient value to retain *Carpilis,* at least as a subgenus, instead of making it an absolute synonym of *Ptochiomera,* as has been done by Barber.

**Cnemodus hirtipes** sp. nov.

Smaller and more slender than typical *mavortius*. Color the same, except that the femora are tinged with fuscous. Hind lobe of pronotum with the sides more thickened and the disk more finely and sparsely punctate. Femora and tibiae furnished with numerous long, erect yellowish hairs. Length, 7-8 mm.

Ormond, Moore Haven, Sarasota and Dunedin, Florida, December 6-April 6. Scarce about Dunedin beneath pine needles and other cover. The macropterous form at porch light. In *mavortius* the tibiae are glabrous and the femora have only a very few widely scattered erect hairs. *Type,* a male from Moore Haven, Florida, March 20, 1922.

## Lepidoptera Geometridae: Notes and Descriptions.

By W. S. Wright, San Diego, California.

**Stamnodes coenonymphata** Hulst.

Of all the species of *Stamnodes* known to me, *coenonymphata* Hulst is perhaps the most puzzling. A small series identified by the late John A. Grossbeck has stood under this name in my collection for a number of years. Three of the series are from the San Francisco Bay region, the rest from San Diego. Before me at the time of this writing is a small series of San Diego specimens from the collection of my friend, George H. Field. The examples in this series were identified by Mr. Louis Swett and the late Mr. Grossbeck. Specimens in the Pearsall and Grossbeck collections now deposited with the American Museum, New York City, were mostly from Mr. Field's and my collections. Practically all these specimens are more or less worn and might easily agree with Hulst's diagnosis, since it lacks certain details which, in the light of recent collections made in San Diego, seem to be necessary to exactly describe the species. Unfortunately I do not have before me either the type or specimens from the type locality. A single specimen from Los Angeles falls into my Group D.

During the winter and spring of 1921-22 I collected about 150 specimens at San Diego. None but perfect specimens were taken. These, together with the small series before referred to, comprise a series of 170 examples. Viewed from above the entire group seems to be quite typical of *coenonymphata* as identified by Swett and by Grossbeck. The three San Francisco specimens differ quite markedly in the form of the wings, the costal edge being much less curved and the apex more produced than in the case with San Diego examples. This small group may require another name. The San Diego specimens easily fall into four groups with variants in each group. While the lines defining the several groups are quite distinct they do not, to my mind, provide sufficient evidence for the erection of new species, but they do, in the light of present day practices among students, justify form or race names.

**Stamnodes coenonymphata coenonymphata** (Hulst).

Group A. This group containing 61 specimens agrees most nearly with Hulst's description of *coenonymphata*. There are, however, some differences. Beyond the third costal spot and near the apex a faint line appears crossing the "dark apex, in triangular shape" parallel with outer margin. This line is a reflection of a sharp division of the apical area beneath, the outer portion being of the same general color as the inner portion but less intense, the difference being due to the presence of some scattered white scales and small masses of red scales in the marginal space. The so-called "broad light colored cross lines, nearly white" on the secondaries fail to appear as described. In the typical specimens of this group the line is narrow, often reduced to a mere hair line. The basal area is nearly black. The narrow white line starts from just beyond the small white discal dot, rounds the cell and reaches the middle of the inner margin perpendicularly. Beyond the white line is a broad blackish band with a few scattered white scales and small masses of red scales. In the marginal space the black of the mesial band gives way to red, while the costal edge from base to mesial dark band is often broadly red with small scattered masses of black scales and, in some specimens, a diffuse mass of white near the outer end of the cell.

This group, although apparently differing rather widely from the description, seems to me to be nearest the type and for it I propose the name *coenonymphata coenonymphata* (Hulst).

**Stamnodes coenonymhata prunata** forma nova.

Group B. has a much different appearance both above and below. Above, the costal spots are larger and more contrasting, the subterminal faint line mentioned in Group A is more conspicuous and the veins in the terminal space are more or less distinctly outlined in yellow. In nearly every specimen of this group the central portion of the "subquadrate darker space" of the primaries is yellowish, especially on the costa where the yellow often occupies fully one-third of the costal space between the second and third costal spots.

Beneath, the maculation is quite remarkable. The costa of primaries is marked by four yellow spots. From the fourth spot a broad line crosses the wing as in typical *coenonymphata*, the apex is of a brilliant white faintly tinged with blue. The basal third of the secondaries is white, with a thick scattering of fuscous-black strigae. Just before the characteristic broad white line at the middle is a clear fuscous-black patch irregular in outline and approximating the inner margin. In the space

beyond the white line is a broad fuscous-black band occupying about half the space between white line and termen and crossing the wing completely from costal to inner edge, while the broad marginal band is a clear brilliant white with a few scattered dark strigae; fringe concolorous.

For this Group, containing 55 specimens, I propose the name *coenonymphata prunata* forma nova.

**Stamnodes coenonymphata pallidata** forma nova.

Group C. contains 46 examples and is more nearly typical above, according to the description, than are the members of either Group A or B; however, beneath it is much lighter in color, with a tendency for the first and second costal marks to become obsolete. The bluish white apical patch of primaries is less brilliant, tending to become more or less obsolete, while the bands of the secondaries tend to become diffuse, losing the fuscous and black scales and tending to numerous strigae and masses of bright red scales.

On account of its much lighter appearance I propose for this group the name *coenonymphata pallidata* forma nova.

**Stamnodes coenonymphata brunneata** forma nova.

The fourth group, Group D, is composed of twelve specimens, much smaller than those of the other three groups, 22 to 25 mm. This group resembles the members of Group C on the upper surface. Beneath, however, there is a wide difference. Only the third costal mark is apparent in most of the specimens, the first and second are either absent or reduced to mere specks. The costal edge and apex are bright red, the rest of the wing is smoky fuscous. The secondaries are a clear red with black strigae in the basal area, while in the area beyond the cell only scattered black atoms appear in the red field. In a few specimens the outer edge of the basal area is marked by a thickening of the black strigae sufficiently to form a definite line across the wing.

For this group I propose the name *coenonymphata brunneata* forma nova.

**Stamnodes coenonymphata eldridgensis** (Swett).

Another small group of six specimens appears to answer to the description of *eldrigensis* Swett.

Some time ago I sent a specimen of what I now propose to call form *prunata* to Mr. Swett, with an MS. giving it specific

standing, for his criticism. He then pointed out to me that it was in all probability his *eldridgensis,* but recently described from a single male taken at Eldridge, California. A careful comparison of Swett's diagnosis with that of Hulst fails to show differences of sufficient clearness to warrant the retention of Swett's species and, in the face of his admissions (in lit.), I feel sure that *eldridgensis* must either fall to *coenonymphata* or become one of its forms, in which case it would be known as *coenonymphata eldridgensis* (Swett).

The recorded captures in all these groups are from the latter part of November to early in March except in Group C which, with but four exceptions was taken in January, two were captured in the last of December and two during the first week of February. All specimens were taken at light, only perfect specimens being taken.

The types and paratypes here listed are all in the author's collection.

**Cosymbia piazzaria** n. sp.

Alar expanse 22-25 mm. Palpi pale, tinged outwardly at tip and on second member with fulvous. Front fulvous, a little lighter just above the clypeus. Antennal pectinations fulvous on the upper side. Thorax and abdomen concolorous with the upper surface of the wings.

*Primaries*:—The ground color above is ochreous with bright fulvous strigations rather evenly distributed over the entire surface of the wings. About one-fourth out from the base is a black line curving outwardly across the wing in a series of dots on the veins. At one-fourth in from the apex a similar line crosses the wing parallel with the outer margin. In the cell a white dot, broadly linear, surrounded by a wide ring of black. Just beyond the discal dot is a broad, smoky, sinuate line or band crossing the wing from costa to inner margin. A terminal line of black dots, while in the base of the fringe and alternate with the black dots is a series of fuscous dots. Fringe short, concolorous and lustrous.

Beneath; the same color as above but with fewer fulvous strigations. Discal dot visible, outer and terminal lines repeated but rather fulvous than black.

*Secondaries* concolorous; lines and bands of the primaries continued across the wings. Beneath; as in the primaries.

The female is colored and marked as in the male with the

exception that the black median band is likely to be more or less fulvous on the disk.

*Holotype*, male, San Diego, California, Aug. 21, 1919. *Allotype*, female, Echo Mt., Calif., July 24, 1921. *Paratypes;* (a) male, San Diego, Calif., Febr. 15, 1916. (b) male, Echo Mt., Calif., July 23, 1921; (c) female, Echo Mt., Calif., July 24, 1921. (d) female, Yavapai County, Arizona, Sept. 13.

I have before me 9 specimens of this very interesting species. Three are so badly damaged as to make it unwise to make them paratypes. One of the three, taken at Prescott, Arizona, is much lighter in color and marked much as in *myrtaria*, the others present all the essential characters of *piazzaria* but are otherwise torn and broken. Paratype (a) is quite remarkable in that the colors are much stronger and more contrasting than in the holotype. The species has much the same general appearance as to color as *myrtaria* while the maculation resembles that of *lumenaria;* I should say that its taxonomic position is between the two.

I dedicate the species to my friend Mr. E. Piazza, of San Diego, through whose kindness I obtained all but one of the specimens.

**Venusia foxi** n. sp.

Expanse 28 mm. Palpi rough scaled, brown. End joint minute and lighter colored. Antennae of the female filiform, scaled above, annulate, ciliate beneath. Front brown and white scales mixed, rounded but not bulging. Vertex and collar concolorous with the front.

Thorax brown; patagiae white with a slight mixture of brown.

Abdomen cinereous with brown and white cross lines at the joints.

Legs brown cinereous; tarsi annulate with white.

*Primaries* with brownish white ground color, darkest along outer margin. A basal half-line, faint on costa but well marked on median vein where it stops. About 2 mm. out is a broad black line accented on the veins, widest on costa and narrowing gradually to inner margin where it terminates about 1.5 mm. out. Between this line and the middle of the wing are three rather indistinct or diffuse black lines accented on the veins, especially on sub-median and on 1a. At the middle, or a little less than half-way out, is a broad black line, appearing as a

black spot from costa to subcosta, a short < mark at beginning of vein 2 and a black streak on 1a. A small black discal dot followed by a sinuate hair line traceable clear across the wing. An extra discal line commences in a squarish spot on costa and parallels the preceding hair line in a series of black dots on the veins. Three more black lines cross the wing in the submarginal space. A submarginal, scalloped, white line crosses the wing from a point about 1 mm. in from apex to anal angle. The nervures through the marginal space are streaked with dark brown or blackish. At the ends of the nervures is a series of twinned black spots. Fringe sordid, checkered with brownish.

*Secondaries* concolorous, darker at margins. Discal dot black. Veins beyond the cell accented with brown. Marginal line as in primaries.

Beneath cinereous; smoky along costa and outward; discal dots apparent; extra-discal line on primaries traceable beyond the cell in both wings. Nervures accented with brown.

*Holotype* female; Mendocino County, California, Aug. 23, 1915 (Fox).

The type agrees best with *Epperrata dilutata* Hübner as described in Packard's Monograph; it is, however, much smaller and quite distinct. I am pleased to dedicate the species to Mr. C. L. Fox, of San Francisco, through whose kindness the specimen came to me.

## The American Species of the Drosophilid genus Stegana (Diptera).

By J. R. Malloch, U. S. Bureau of Biological Survey, Washington, D. C.

In this paper are presented in synoptic form brief descriptions of the species of the genus *Stegana* Meigen which are known to occur in the New World with the exception of one described by Williston from St. Vincent.

The material was, with the exception of one specimen, collected by Pablo Schild in San Mateo, Costa Rica; the single exception being a paratype of *uniformis* taken in the Canal Zone, Panama, by R. C. Shannon. The types are all in the United States National Museum collection.

Fuller descriptions will appear later in the Proceedings of the National Museum.

*Key to Species.*

1. Thorax and abdomen brownish black, only the humeri and apex of scutellum yellowish; all femora and mid and hind tibiae except their apices pitchy black; palpi, frons and knobs of halteres brownish black; apical scutellar bristles about three-fourths as long as basal pair; pleura not conspicuously vittate with black *nigrita* sp. n.

— Thorax more largely yellowish, at least the lower half of pleura pale, usually with a well differentiated black vitta on upper half ..................................2

2. Fore tarsi compressed, three or four segments deep black, fifth or basal and fifth pale yellow.................3

— Fore tarsi not or very slightly compressed, with at most the basal two segments dark.......................4

3. Palpi partly black; basal segment of fore tarsi pale yellow; pleura with a deep black vitta on upper part *tarsalis* Williston

— Palpi yellow; basal segment of fore tarsi black, only the fifth pale yellow; pleura with two blackish vittae; eye fully as high as long; scutellum with the apical pair of bristles not half as long as basal pair; third antennal segment mostly black, pale only at extreme base *atrimana* sp. n.

4. Palpi largely or entirely black.......................5

— Palpi entirely yellow..............................8

5. Height of cheek posteriorly at least as great as width of third antennal segment; antennae hardly extending to mouth margin, generally entirely pale yellow; thorax normally with three narrow complete black vittae, two incomplete paler vittae laterad of these, and the lateral margins blackish; pleural vittae entire; all tibiae yellow; face usually yellow, with an elongate mark in each antennal fovea; eyes much higher than long; scutellum with the apical pair of bristles about two-thirds as long as the basal pair; labrum yellow.....*curvipennis* Fallen

— Cheek linear, at no point half as high as width of third antennal segment; antennae extending to or below mouth margin ........................................6

6. The black vitta on upper part of pleura not entire, not extending to anterior margin of propleura; thoracic dorsum yellow, with two broad entire submedian fuscous vittae, and the lateral margins fuscous from slightly in front of bases of wings to hind margin, the mesonotum thus having a broad yellow mark from propleura run-

ning obliquely over humeral angle to near middle of disc; frons with a very large black mark on ocellar region and another on anterior margin connected by a black median line; femora except apices, and tibiae in middle black; face not carinate above; vibrissal angle and sides of labrum conspicuously blackened; a vitta over upper part of sternopleura; fore tarsi yellow *interrupta* sp. n.

— The black vitta on upper part of pleura complete, extending broadly over propleura; mesonotum not vittate as above, no oblique pale humeral stripe .............7

7. Fore tarsi entirely yellow; mesonotum with two rather distinct narrow dark vittae along each lateral margin; fore femur with a brown band at base and a brown spot at apex on anterior side; face with a rounded convex elevation in center above middle, and two black transverse bands, one close to lower margin and the other over the convexity; frons marked as in *interrupta* *tempifera* sp. n.

— Basal segment of fore tarsi largely or entirely fuscous; mesonotum not noticeably vittate; fore femur with a blackish mark at apex on anterior side; face concave, entirely yellowish; frons yellow, ocellar region blackish *flavifrons* sp. n.

8. Eye longer than high; cheek as high as width of third antennal segment .................................9

— Eye at least as high as long, generally higher; cheek linear, or almost so, not over half as high as width of third antennal segment ...............................14

9. Wing unevenly infuscated, the costal margin broadly brown, two spots in first posterior cell, one in middle of discal cell, the veins and apical margin suffused with brown, the latter irregularly so; dorsum of thorax with six, pleura with two black vittae; large species, 6 mm. in length ...........................*magnifica* Hendel

— Wing almost uniformly infuscated, generally slightly paler along hind margin, never spotted; each humeral angle with two bristles except in *coleoptrata*..............10

10. Face not noticeably carinate in center below bases of antennae; thoracic dorsum and scutellum brownish black, the latter with a conspicuous white central vitta which is not sharply margined; mid and hind femora each with a fuscous stripe which runs obliquely downward from near middle to near apex on anterior side; frons glossy black,

yellowish on each side in front of proclinate bristle, and at each anterior lateral angle.......... *planifacies* sp. n.

— Face with a conspicuous sharp ridge or carina on upper half in center; scutellum without a conspicuous white central vitta; femora not marked as above...........11

11. Frons entirely glossy black; mesonotum and abdomen brownish black, the former paler on sides, but not distinctly vittate; inner cross-vein of wing at middle of discal cell; femora of mid and hind legs broadly fuscous at apices, tibiae of same legs fuscous at bases *atrifrons* sp. n.

— Frons largely yellow..............................12

12. Anterior third of frons glossy black, remainder dusky yellow, the ocellar region brownish or fuscous; inner cross-vein close to middle of discal cell; mid femora dark brown on apical half or more, most conspicuously so on anterior side, hind femora less distinctly marked, the brown color extending along almost the entire anterodorsal surface.......................... *schildi* sp. n.

— Anterior third of frons not darker than ocellar region; inner cross-vein very distinctly proximad of middle of discal cell ......................................13

13. Anterior third of frons and a large mark covering ocellar region and extending from vertex to middle, but not covering lateral margins, black; mesonotum with the brown vittae in part fused, giving it the appearance of having a broad central vitta, which is widened posteriorly, and one on each side, which is more or less subdivided by yellow lines; scutellum uniformly fuscous brown; each humeral angle with two bristles.............. *uniformis* sp. n.

— Frons inconspicuously marked with pale brown, ocellar region fuscous; mesonotum with six brown vittae, the median pair sometimes fused; scutellum usually with a pale median line; each humeral angle with one bristle *coleoptrata* Scopoli

14. Pleura without an opaque black vitta above; inner cross-vein at one-third from base of discal cell; wing brown, hyaline from base to inner cross-vein, and with a large hyaline spot beyond outer cross-vein; interfrontalia rather densely covered with microscopic erect hairs; apical scutellar bristles not much shorter than basal pair; subcostal cell pointed at apex; fifth vein continued in a straight line beyond outer cross-vein, its apex slightly curved upward; fourth vein curved forward on apical

third of its last section, not gradually approaching third on its entire length..... *Orthostegana acutangula* Hendel

— Pleura with a very conspicuous opaque black vitta on upper portion; inner cross-vein at or very close to middle of discal cell; wing more uniformly brown, posterior margin generally paler, but there are never sharply defined hyaline areas; inter-frontalia bare; fifth vein usually rather abruptly deflected at or very little beyond outer cross-vein.................................15

15. Face entirely yellow; frons yellow, ocellar region darker; antennae yellow, apex of third segment black; mid femur with a brown spot beyond middle; knobs of halteres yellow ........................*brunnea* sp. n.

— Face not entirely yellow............................16

16. Face and frons yellow, the former with a narrow black cross-band above mouth and sometimes a darkened area below bases of antennae; frons yellow, ocellar region fuscous; antennae yellow, third segment partly or entirely black...................................17

— Face and frons brownish fuscous; antennae but little paler than face except basally.........................18

17. Third antennal segment almost entirely deep black; cheek over half as high as width of third antennal segment; fore tibia dark brown beyond middle; eye about as long as high..............................*affinis* sp. n.

— Third antennal segment blackened at apex; cheek linear, much less than half as high as width of third antennal segment; fore tibia dark brown at base; eye distinctly longer than high.....................*conformis* sp. n.

18. Fore tarsi and tibiae yellow; cheeks linèar.*flavimana* sp. n.

— Bases of fore tibiae and basal two segments of fore tarsi dark brown; cheek about half as high as width of third antennal segment....................*fuscibasis* sp. n.

From the description I judge that *horae* Williston will run to *tempifera* in this key but there are color differences which cause me to consider that it is probably not that species. An examination of the type will be necessary to determine its identity.

All the species in the key average from 2 to 3.5 mm. in length with the exception of *interrupta* and *acutangula* unless where mention is made of the size, and all conform in the generic characters distinguishing the genus from *Phortica* Schiner.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., MARCH, 1924.


## Flying Men and Insects.

A recent interesting bulletin (No. 1204, January, 1924) of the United States Department of Agriculture, entitled "Dusting Cotton from Airplanes," by B. R. Coad, E. Johnson and G. L. McNeil, describes a phase of Tennyson's well-known prediction—

> Heard the heavens fill with shouting and there rain'd a ghastly dew.
> From the nations' airy navies grappling in the central blue,

of which the poet probably never dreamed. By coöperation of the Federal Bureau of Entomology and the Air Service of the United States Army, experiments were made at Tallulah, Louisiana, in August, 1922, to determine the possibility of checking the cotton leafworm (*Alabama argillacea* Hüln.) by dusting the threatened plants with insecticides from airplanes.

Many technical difficulties had to be overcome, as set forth at length in the bulletin. Flights were made at varying elevations from 5 to 50 feet above the cotton plants "and it was almost always possible to distribute the poison from 25 feet or lower regardless of air conditions," as for example, "with an 8-mile breeze blowing, which would render absolutely impossible any effort to dust cotton with ordinary ground dusting machines." In some of the tests the airplane operated "at an average rate of ground speed of 88 miles an hour and the 120 pounds [of calcium arsenate] contained in the hopper lasted over a strip 17,424 feet long." The flights were directed from the ground by a system of wig-wag signals with white flags.

Among the advantages claimed for the use of airplanes for this purpose are their independence of ground conditions, such as rain-soaked fields which would prevent the employment of any ground machines, or the presence of stumps and similar obstacles, and an actual economy of cost at least where large areas are concerned.

Many illustrations, some very striking, accompany the bulletin.

The airplane has frequently been suggested for the exploration of relatively inaccessible countries. We look forward to its use by some enterprising entomologist to obtain the gorgeous butterflies which frequent the flowers at the summits of mighty trees in the tropical forests, or rare and swift flying cicadas and dragonflies. The hitherto inviolate habitats of restricted mountain insects will be invaded by the knight of the net and the bottle and the supremacy of the Age of Insects will be threatened by the Flying Man.

## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### On the Synonymy of Prodenia eridania Cram. (Lep., Phalaenidae=Noctuidae.

**Prodenia eridania Cram.** (partim.)
1782, Cram., Pap. Exot., IV, 133, pl. CCCLVIII, f. F, (nec E), *Noctua.*
1825, Hbn., Verz., p. 244, *Calliergis.*
1852, Gn., Sp. Gén., V, Noct., I, 148, *Xylomyges.*
1856, Wlk., Cat. Lep. Het. B. M., IX, 182, *?Xylomyges.*
1893, Sm., Bull. U. S. N. M., XLIV, 169, *Prodenia.*
1909, Hamp., Cat. Lep. Phal. B. M., VIII, 271, as *eridania* ab. 1 = *externa, Xylomyges.*
1917, B. & McD., Check List, p. 67, No. 2573, *Prodenia.*

*externa* Wlk.
1856, Wlk., Cat. Lep. Het. B. M., IX, 114, *Leucania.*
1909, Hamp., Cat. Lep. Phal. B. M., VIII, 272, *eridania* ab. 1, *Xylomyges.*

*nigrofascia* Hlst.
1881, Hlst., Bull. B'klyn Ent. Soc., III, 77, *Leucania.*
1881, Tepper & Smith, Bull. B'klyn Ent. Soc., IV, 7, pl. I, f. 9, *nigrafascia* (in err.), *Leucania.*

form norm. **linea** Fabr.
1794, Fabr., Ent. Syst., III, No. 2, 106, *Noctua.*
1909, Hamp., Cat. Lep. Phal. B. M., VIII, 271, text fig. 73, as *eridania, Xylomyges.*

*eridania* Cram. (partim.)
1782, Cram., Pap. Exot., IV, 133, pl. CCCLVIII, f. E, (nec F), *Noctua.*

*phytolaccae* A. & S.
1797, A. & S., Lep. Ins. Ga., II, 193, pl. XCVII, biol., *Phalaena.*

1852, Gn., Sp. Gén., V, Noct., I, 148, = *eridania* Cram. 358E, *eridania* var., *Xylomyges.*

1856, Wlk., Cat. Lep. Het. B. M., IX, 183, *eridania* var. *B.*, *?Xylomyges.*

*derupta* Morr.

1875, Morr., Proc. Ac. Nat. Sci. Phila., p. 62, *Actinotia.*

The correct nomenclature of this economic species appears confused.

Cramer figured both the normal form and the form with the black fascia from reniform to termen.

Guenée (1852) restricted the name *eridania* to figure F of plate CCCLVIII of Cramer, placing the normal form as *phytolaccae* A. & S. In this, he is followed by Walker (1856).

Hampson (1909) seems to have overlooked these prior fixations, designating the form with the black fascia as *eridania* ab. 1 = *externa* Wlk.

The normal form of the species will apparently have to be called *Prodenia eridania* form *linea* Fabr., while the aberrant form with the black fascia, not restricted to females, must take the specific name, *Prodenia eridania* Cram.

Only that part of the bibliography which may prove of interest is listed. Other synonyms, based on exotic specimens, are not listed herein; (see Smith 1893 and Hampson 1909).—WM. BARNES and F. H. BENJAMIN, Decatur, Illinois.

---

## On the Retention of ii or i in Specific Patronymic Names.

In general the rules formulated by the Ninth International Zoological Congress, and the opinions rendered by the International Commission on Zoological Nomenclature, regarding the retention of *ii* or *i* in specific patronymic names seem to have escaped the attention of Lepidopterists.

The Barnes and McDunnough *Check List,* and most workers, have followed Article 14 of the International Rules, which states; "If the name is a modern patronymic, the genitive is always formed by adding, to the exact and complete name, an *i* if the person is a man, or an *ae* if the person is a woman, even if the name has a Latin form; it is placed in the plural if the dedication involves several persons of the same name."

The result has been that many names originally published with *ii* termination have been changed to *i* termination.

However, Article 19 states; "The original orthography of a name is to be preserved unless an error of transcription, a *lapsus calami,* or a typographical error is evident".

The question of the *ii* versus *i* in specific patronymic names, is exhaustively dealt with in Opinion 8 of the International Commission, (see Pub. 1938, Smithsonian Institution, pp. 11-12, 1910).

As this opinion may be unavailable to many readers, its conclusion is quoted.

"The conclusion must therefore be drawn that under the present Code the original form of the name should be retained, regardless of the question whether it ends in *i* or *ii*, although authors are advised to be very careful about this point in forming new names, and to adopt the *ii* only when the person's name used as a basis for the specific name ends in *i*".—WM. BARNES and F. H. BENJAMIN, Decatur, Illinois.

---

### The Genus Cyptobunus Banks (Phalangida).

In 1905 Banks described (Ent. News, 16:252) a small Phalangid from a cave near Limespur, Montana, which he named *Cyptobunus cavicolus*. Banks based his genus *Cyptobunus* primarily on the absence of lateral teeth on the claws of the tarsi of the third and fourth legs. In 1914 Roewer (Arch. f. Naturg. v. 80, Abt. A. Heft. 12, p. 167) stated that he believed that the type was an immature specimen and that the real position of the genus must await the examination of mature specimens.

Some years ago the Cornell University collection received from Prof. R. A. Cooley two specimens of the species from the same cave, collected in 1910. They are apparently mature and about 2 mm. in length. The claw of the tarsi of the third and fourth legs bear on each side a small but distinct tooth. Since in other respects this species agrees generically with *Sclerobunus robustus* Packard, the type of the genus, it must be placed there. *Cyptobunus* therefore becomes a synonym of *Sclerobunus*.—C. R. CROSBY and S. C. BISHOP, Cornell University, Ithaca, New York.

---

### Muscina pascuorum Meigen in Maryland (Dipt.: Muscidae).

This common European fly, first captured in America in 1922 in Massachusetts, Connecticut, New York and New Jersey (C. W. Johnson, Psyche, XXX, 1, 1923) is taken this, the following year at Plummers Island, Maryland; one female, in house, November 11, 1923. R. C. SHANNON, U. S. National Museum, Washington, D. C.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**6**—Journal of the New York Entomological Society. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **20**—Bulletin de la Societe Entomologique de France, Paris. **21**—The Entomologist's Record, London. **42**—Entomologiske Meddelelser udgivne af Entomologisk Forening, Kjobenhavn. **49**—Entomologische Mitteilungen Berlin-Dahlem. **50**—Proceedings of the United States National Museum. **57**—Biologisches Zentralblatt, Leipzig. **59**—Journal of Agricultural Research, Washington, D. C. **64**—Parasitology, London. **68**—Science, Garrison on the Hudson, N. Y. **72**—The Annals of Applied Biology, London. **76**—Nature, London. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **78**—Bulletin Biologique de la France et de la Belgique, Paris. **79**—Bulletin of the Museum of Comparative Zoology at Harvard College, Cambridge, Mass. **85**—The Journal of Experimental Zoology, Philadelphia. **87**—Arkiv for Zoologi, K. Svenska Vetenskapsakademien, Stockholm. **90**—The American Naturalist, Lancaster, Pa. **99**—Bulletin du Museum National d'Histoire Naturelle, Paris. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **101**—Journal of The Linneau Society of London. **116**—Entomologische Zeitschrift, Frankfurt, a. M. **119**—Proceedings of the National Academy of Sciences of the U. S. A., Washington, D. C. **133**—Zoologica. Scientific Contributions of the New York Zoological Society. **141**—Internationale Entomologische Zeitschrift, Guben, Germany. **154**—Annales de la Societe Linneenne de Lyon.

**GENERAL. Baker, C. F.**—Comparison of neotropical and palaeotropical insect faunae (Phil. Jour. Sci., xxiii, 531-2.) **Clements and Long**—Experimental pollination. An outline of the ecology of flowers and insects. (Carnegie Inst. Wash., Pub., No. 336.) **Fabre, J. H.**—Biographical note. (La Nature, 1923, 353-4.) **Horn, W.**—Et meminisse et vaticinari liceat. 15. Ueber Kropotkin und Darwin. **49,** xii, 215-6. **Howard, L. O.**—Retarded establishment of introduced parasites of injurious insects. **119,** x, 16-18. **Hungerford, H. B.**—Historical account of department of entomology [Kansas Unive.]. (Kans. Univ. Sc. Bul., xiv, 7-15.) **Lawson, P. B.**—Report upon the celebration of May 16, 1921, in honor of the twenty-fifth anniversary of S. J. Hunter's connection with the department. (Kans. Univ. Sc. Bul., xiv, 21-3.) **Moore & Hungerford.**—Water insects from a portion of the southern Utah desert. (Kans. Univ. Sc. Bul., xiv, 409-21.) **Pavlovsky, E. N.**—Description of a box for collecting and transporting living insects, etc. **64,** xiv, 47-50. **Pratt, J. G.**—Preparing insects for the camera. (Nature Mag., 1924, 95-98.) **Swinehoe, C.**—Obituary. **9,** lvii, 23-4. **Wulker, G.**—Parasitische wurmer bei insekten. **141,** xvii, 138-43 (cont.)

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC. Brambell, F. W. R.**—Sex-reversal and intersexuality. (Jour. R. Microsc. Soc., 1923, 395-408.) **Burrows, M. T.**—A study of the relation between function and growth in body cells (Kans. Univ. Sc. Bul., xiv, 475-504.) **Clausen, R. E.**—The inheritance of cinnabar eye color in Drosophila melanogaster, including data on the locus of jaunty. **85,** xxxviii, 423-36. **Crampton, G. C.**—A comparison of the labium in certain holometabolous insects from the standpoint of phylogeny. **10,** xxv, 171-80. **Glenn, P. A.**—A problem in the relation of temperature to rate of insect development. (Kans. Univ. Sc. Bul., xiv, 317-23.). **Hering, M.**—Das histologische bild der von insektenlarven erzeugten blattminen. (Mikrokosmos, xvii, 49-53.) **Kopec, S.**—Studies on the influence of inanition on the development and the duration of life in insects. On the heterogeneous influence of starvation of male and of female insects on their offspring. **100,** xlvi, 1-21; 22-34. **McFarland, J.**—Fighting foes too small to see. (Philadelphia, F. A. Davis Co., 1924, 309 pp.) **Turner, C. H.**—A new field method of investigating the hydrotropisms of fresh-water invertebrates. **100,** xlvi, 35-54.

**ARACHNIDA AND MYRIOPODA. Chamberlin, R. V.**—The northern range of the scorpion. **68,** lix, 64. **Han-**

**strom, B.**—Ueber die histologie und vergleichende anatomie der sehganglien und globuli der araneen. (Kongl. Svenska Vet.-Akad. Handl., lxi, No. 12.) **Mallock, A.**—The eyes of spiders. **76**, cxiii, 45-8. **Sokolska, J.**—L'appareil de Golgi dans les cellules somatiques et sexuelles (spermatogenese et ovogenese) de l'araignee domestique (Tegenaria domestica). **77**, lxxxix, 1395-6. **Archey, G.**—A new genus of Chilopoda from Br. Guiana, and a n. sp. of Wailamyctes from Auckland Island. (Rec. Canterb. Mus., ii, 113-16.) ***Ewing, H. E.**—Holosiro acaroides, new genus and species, the only New World representative of the mite-like phalangids of the suborder Cyphophthalmi. **7**, xvi, 387-90.

**THE SMALLER ORDERS OF INSECTA. John, O.**—Fakultative viviparitat bei Thysanopteren. **49**, xii, 227-32. **Meissner, O.**—Wespen und libellen, **116**, xxxvii, 35-6.

***Banks, N.**—Descriptions of new neuropteroid insects. **79**, lxv, 421-55. **Ferris, G. F.**—The mallophagan family Trimenoponidae. **64**, xiv, 75-86. ***Ferris, G. F.**—Contributions towards a monograph of the sucking lice. (Stanford Univ. Pub., Biol. Sci., ii, No. 4). **Lacroix, J. L.**—Etudes sur les Chrysopides. II. Memoire. **154**, 1922, 119-44. **Snyder, T. E.**—A new Prorhinotermes from Panama. (Jour. Wash. Ac. Sci., xiv, 43-5.)

**HEMIPTERA. Buchner, P.**—Ueber ein neues, symbiontisches organ der bettwanze. **57**, xli, 570-4. **DeLong, D. M.**—The distribution of the leafhoppers of Presque Isle, Pa., and their relation to plant formations. **7**, xvi, 363-73. **Doering, K.**—Biology and morphology of Lepyronia quadrangularis. (Cercopidae). (Kans. Univ. Sc. Bul., xiv, 515-87.) **Hackman, L. M.**—Studies on Cicadella hieroglyphica. (Kans. Univ. Sc. Bul., xiv, 189-209.) **Hungerford, H. B.**—The life history of the toad bug. (Kans. Univ. Sc. Bul., xiv, 145-71.) **Leonard & Barber.**—The immature stages of the catnip leafhopper (Eupteryx melissae). **6**, xxxi, 181-4. **Readio, P. A.**—The ovipositors of the Cicadellidae. (Kans. Univ. Sc. Bul., xiv, 217-98.) **Wadley, F. M.**—Factors affecting the proportion of alate and apterous forms of aphids. **7**, xvi, 279-303. **Wiley, G. O.**—Life history notes on two species of Saldidae found in Kansas. Some notes on the biology of Curicta from Texas. (Kans. Univ. Sc. Bul., xiv, 301-11; 507-11. )

**Baker, A. C.**—An undescribed orange pest from Honduras. **59**, xxv, 253-4. **Bondar, G.**—Aleyrodideos do Brasil. (Secret. Agric., Indust. . . . Bahia, 1923, 182 pp.)

***Hungerford, H. B.**—The Nepidae of North America. (Kans. Univ. Sc. Bul., xiv, 425-69.) ***Lawson, P. B.**—The genus Acinopterus (Cicadellidae). (Kans. Univ. Sc. Bul., xiv, 113-39.) **Lawson, P. B.**—The Membracidae of Kansas. (Kans. Univ. Sc. Bul., xiv, 31-110. ***Mason, P. W.**—The raspberry cane aphid. **10,** xxv, 188-90. ***Osborn & Lathrop.** The genus Phlepsius in North America. (Homoptera). **7,** xvi, 310-63. **Porter, C.**—Insecto nuevo de la fam. Berytidae. (Rev. Chilena Hist. Nat. xxvii, 20-21.) **Woodruff, L. B.**—Supplementary notes on Ophiderma. (Homoptera). **6,** xxi, 188-90.

LEPIDOPTERA. **Baylis, H. A.**—Colour production in L. **9,** lvii, 2-6. **Coolidge, K. R.**—The life history of Thanaos funeralis. (Hesperiidae). **6,** xxxi, 175-81. **Robertson-Miller, E.**—Observations on the bellura. (Bellura gortynoides). **7,** xvi, 374-86. **Turner, H. J.**—Lycaenid larvae and ants. "Hermaphroditism" in the Hesperiidae. **21,** xxxvi, 8-9. **Vansell, G. H.**—The urinary system of Phlegethontius sexta. (Kans. Univ. Sc. Bul., xiv, 365-9.)

**Beebe, W.**—Notes on Galapagos L. **133,** v, 50-9. **Bouvier, E. L.**—Observations sur quelques Saturniens recueillis au Venezuela. Quelques Saturniens nouveaux de l'Amerique tropicale. **99,** 1923, 5 353-9; 422-7. **Dyar, H. G.**—New L. from Mexico and one from Argentina. **15,** xii, 15-21. ***Dyar, H. G.**—A new noctuid from Louisiana. **15,** xii, 21-2. **Le Cerf, F.**—Descriptions de formes nouvelles de lepidopteres rhopaloceres. **99,** 1923, 360-7, 428-9. **Niepelt, W.**—Neue formen palaearktischer und exotischer lepidopteren. **141,** xvii, 134. **Niepelt, W.**—Neue u. wenig bekannte exotische Rhopaloceren. **141,** xvii, 138. **Schaus, W.**—Galapagos heterocera with descriptions of new sps. **133,** v, 23-48.

DIPTERA.—**Bezzi, M.**—On the dipterous genera Passeromyia and Ornithomusca, with notes and bibliography on the non-pupiparous Myiodaria parasitic on birds. **64,** xiv, 29-46. **Freeborn, S. B.**—The "proepimera" of the Culicidae. **15,** xii, 37-8. **Frew, J. G. H.**—On the larval and pupal stages of Forcipomyia piceus. **72,** x, 409-41. **Frew, J. G. H.**—On the morphology of the head capsule and mouth parts of Chlorops taeniopus. **101,** xxxv, 399-410. **Genna, M.**—Ricerche sulla nutrizione dell'Anopheles claviger. (Arch. Zool. Ital., x, 15-33.) **Morris, H. M.**—On the larva and pupa of a parasitic phorid fly, Hypocera incrassata. **64,** xiv, 70-4. **Seguy, E.**—Note sur les larves des Muscina stabulans et assimilis. **99,** 1923, 443-5. **Shannon, R. C.**—Some special features of

the wings of D. **15,** xii, 34-6. **Turner, C. L.**—The Psychodidae (moth-like flies) as subjects for studies in breeding and heridity. **90,** lvii, 545-58.

**Aldrich, J. M.**—The genus Philornis—a bird-infesting group of Anthomyiidae. **7,** xvi, 304-9. ***Claasen, P. W.**—The larva of a chironomid (Trissocladius equitans n. sp.) which is parasitic upon a may-fly nymph (Rithrogena sp.) (Kans. Univ. Sc. Bul., xiv, 395-405.) **Dyar, H. G.**—Note on Aedes punctor. The mosquitoes of Colorado. **15,** xii, 24-6, 39-46. **Dyar & Shannon.**—New Culex from Panama. **15,** xii, 46-8. ***Garrett, C. B. D.**—Some new American Helomyzidae. **15,** xii, 26-34. **Matheson, R.**—Notes on Culicidae (Aedes). **15,** xii, 22-4. **Shannon, R. C.**—Notes on Calliphoridae. **15,** xii, 14. ***Van Duzee, M. C.**—Notes and descriptions of two-winged flies of the family Dolichopodidae from Alaska. **50,** lxiii, Art. 21. ***Wehr, E. E.**—Synopsis of the Tabanidae of Nebraska, with description of a new species from Colorado. A synopsis of the Syrphidae of Nebraska with descriptions of n. sps. from Nebraska and Colorado (Univ. Neb., Univ. Stud., xxii, 107-18; 119-62.)

**COLEOPTERA. Bertin, L.**—L'adaption des pieces buccales aux regimes alimentaires chez les coleopteres lamellicornes. **154,** 1922, 145-59. **Beyer, A. H.**—A brief resume of investigation made in 1913 on Trogoderma inclusa. (Dermestidae). (Kans. Univ. Sc. Bul., xiv, 373-91). **Falcoz, L.**—Etudes sur les Cryptophaginae. **154,** 1922, 165-83. **Gadeau de Kerville, H.**—Description et figuration d'anomalies coleopterologiques. **20,** 1923, 229-33. **Kuntze, R.**—Analyse genetique de la varibilite de la coloration chez les coleopteres Melasoma aenea. **77,** lxxxix, 1392-4. **Wilson, C. B.**—Water beetles in relation to pondfish culture, with life histories of those found in fishponds at Fairport, Iowa. (Bul. Bur. Fish. Wash., xxix, 231-345.)

**Barber, H. S.**—Two new Conotrachelus from tropical fruits. (Curculionidae). **10,** xxv, 182-5. **Benderitter, E.**—Quelques Rutilides nouveaux. **20,** 1923, 216-9. **Dawson, R. W.**—A synopsis of the Scarabaeidae of Nebraska. (Univ. Neb. Stud., xxii, 163-244.) **Desbordes, H.**—Description de reninus nouveaux de la Republique Argentine et tableaux de determination des especes de ce genre. **99,** 1923, 368-71. **Fisher, W. S.**—A change of name in Buprestidae. **10,** xxv, 190. **Horn, W.**—Einiges ueber neue und alte Cicindeliden. **42,** xiv, 211-16. ***Leng, C. W.**—New species and synopsis of Statira. **6,** xxxi, 184-8. **Portevin, G.**—Description d'une

nouvelle espece de Silphide des collections du museum. **99,** 1923, 380-1.

**HYMENOPTERA. Isely, D.**—Notes on nesting of Polistes. (Kans. Univ. Sc. Bul., xiv, 341-3.) **Meissner, O.**—Wespen und libellen. **116,** xxxvii, 35-6. **Nielsen, E.**—Contributions to the life history of the pimpline spider parasites (Polysphincta, Zaglyptus, Tromatobia). **42,** xiv, 137-205. **Olsen, C. E.**—Backyard collecting in Ramsey, N. J. **6,** xxxi, 171-5. **Picard, F.**—Recherches biologiques et anatomiques sur Melittobia agasta. **78,** lvii, 469-508. **Roth, P.**—A propos de instinct de Bembex rostrata. **154,** 1922, 47-52. **Sandhouse, G. A.**—A gyandromorphic bee of the genus Osmia. **90,** lvii, 569-70. **Stumper, R.**—L'illusion des amputes chez les fourmis. (La Nature, Paris 1923, 335-6. **Viereck, H. L.**—The flower relations of wild bees. (Can. Field-Nat., xxxvii, 164-5.)

**Friese, H.**—Wissenschaftliche ergebnisse der schwedischen entomologischen reise des A. Roman in Amazonas—Apidae. **87,** xv, No. 13. **Gahan, A. B.**—Types of two chalcid-flies misidentified. **10,** xxv, 185-8. ***MacGillivray, A. D.**—Sawflies of the Katmai expedition to Alaska. **6,** xxxi, 163-71. **Mann, W. M.**—Two serphoid guests of Eciton. **10,** xxv, 181-2. ***Phillips and Poos**—Five n. sps. belonging to the genus Harmolita (Isosoma auct.) (Kans. Univ. Sc. Bul., xiv, 349-59.) **Wheeler, W. M.**—Wissenschaftliche ergebnisse der schwedischen entomologischen reise des A. Roman in Amazonas—Formicidae. **87,** xv, No. 7.

## SPECIAL NOTICES

**Hemiptera:** Science bulletin of the University of Kansas, Vol. XIV, has just come to hand. It contains 587 pages, including many plates, all with the exception of a small paper on Crustacea, treating of subjects of entomological interest. The largest papers are reviews or monographs of several families and genera of the Hemiptera, while others are of more biological and anatomical nature, mainly of several species of Hemiptera. This volume is dedicated to Samuel John Hunter, Head of Department of Entomology. **Macrolepidoptera of the World.**—Parts 306-308, Fauna americana parts 128-130 have been issued in the English edition. These continue the Hesperiidae by Dr. M. Draudt.

The **Catalogue of Indian Insects,** Part 1 of which on the Acrydidae (Tettigidae) was reviewed in the NEWS for March,

1922, page 95, has been advanced by the publication of Part 2. Culicidae and Part 3. Bombyliidae, both by Ronald Senior-White (Calcutta, Sup't Govt. Printing, India, 1923). The Indian Culicid fauna "is now represented by 28 genera containing a total of 160 valid species and varieties," the Bombyliid by 17 genera and 103 species. In both parts the localities, both within and outside of India, cited in each reference are given as marginal notes.

The progress of Indian Entomology is recorded in a **List of Publications on Indian Entomology, 1920-21,** compiled by the Imperial Entomologist (Bull. 139, Agri. Research Inst., Pusa; Calcutta, Supt. Govt. Printing, India, 1922; 67 pp.) The publications are listed under their authors' names, the names arranged alphabetically. The title and place of publication of each article are followed by a list of the Indian and near-Indian species concerned. No means of finding the papers on any given group of insects is furnished, however.

---

The recent death of the Hon. N. C. Rothschild (see the NEWS for February, page 76) lends a melancholy interest to Part 5 of Volume I of **Ectoparasites,** published Nov. 10, 1923; which he edited in conjunction with Dr. K. Jordan. It comprises pages 287-370, text figures 281-383 and contains five articles by the two editors on Swiss, Algerian, Eastern Hemisphere and American (North and South) Siphonaptera and a revision of the fleas of the chiefly neotropical genera Rhopalopsyllus and Parapsyllus, with keys to the American species of both.

---

Under the title **Some Remarks about the supposed scent-organs of the Genus Opsiphanes,** Heer J. H. Juriaanse describes and figures (Tijdschr. v. Ent. LXVI, pp. 147-151, pl. 2, 1923) structures which he sums up as follows:

"The sexual attraction mechanism of this male [Brassolid] butterfly consists of three leading functions, viz. 1. The secretion of scent by a gland at each side of the abdomen. 2. The ejection of same over a special contact-organ consisting of bud-shaped projections implanted in those glands. 3. The distribution of the scent in the air derived from those projections by the contact of a hair pencil on the wing."

---

EXTERNAL INSECT-ANATOMY by ALEXANDER D. MACGILLIVRAY, Urbana, Illinois. The Scarab Co., 1923.*

In *External Insect-Anatomy* the author has departed from the usual method of writers on entomology by an attempt to bring

[*The review of this work published in the NEWS for January suggested submitting the volume for comment to Mr. Turner, a senior in

the material of the text-book into closer relation with the work in the laboratory. Such an innovation is particularly desirable in connection with a subject such as comparative morphology in which there is such a close inter-relationship between the laboratory work and the background usually afforded by the text-book, so that the author would be justified in asserting that the method in which his material is presented as well as the material itself supplies a real need.

The bulk of *External Insect-Anatomy* consists of outlines for the study of a wide variety of insects representing the fruits of a tremendous amount of work on the part of the author and those who have collaborated with him. These laboratory outlines are grouped in appropriate sub-topics under the general headings of Fixed Parts of the Head, Movable Parts of the Head, Thorax, Abdomen, Legs and Wings. No attempt has been made, as is sometimes the case, to make structures which are really very complicated appear simple by disregarding the minor points of anatomy; the student who has mastered well-chosen portions of *External Insect-Anatomy* will have an unusually firm basis on which to proceed with further studies in systematic entomology and taxonomy.

What may be termed the text-book portion of *External Insect-Anatomy* consists of generalized discussions in considerable detail introducing each topic and sub-topic. These are intended primarily for use in connection with the laboratory outlines which follow, and for this reason the illustrations are few in number and, with several exceptions, all of a hypothetical character. As a consequence the beginner in entomology would find the book of little profit to him except when used in conjunction with laboratory work; when so used, however, it would be entirely suitable for the beginner, as no previous knowledge of insects is assumed.

In the matter of illustrations the chapter on wings presents a contrast to the remainder of the volume; here the author has found it advisable to accompany the reference to each species with a drawing of a wing. The excellent discussion at the beginning of this chapter on the origin and development of wings is also well illustrated.

The student who is already familiar in a general way with the anatomy of one insect, say the grasshopper or cricket, will re-

---

the College Department of the University of Pennsylvania. Mr. Turner began his first course in Entomology in October, 1923, having previously completed courses in general zoology and in invertebrate zoology (exclusive of insects). He tells me that he had not read any notices of Dr. MacGillivray's book up to the time that his manuscript was placed in my hands. I have carefully avoided trying to influence Mr. Turner's opinions on the book.—EDITOR.]

gard the absence of illustrations as a real advantage, since it has permitted of a degree of completeness not usually found in a book of such handy size. The unusual care taken in the matter of arrangement and the inclusion of extra material which helps in the full understanding of the subject-matter proper makes the acquisition of this abundance of information a much easier matter for the student than it might otherwise be.

The comprehensive introduction contains all the preliminary material that is needed by the beginner, including a discussion of technical nomenclature, a subject with which familiarity is too often assumed. As occasion requires series of clear definitions are given of the terms about to be employed. Other commendable features are the pronouncing index and the list at the end of the volume giving the systematic position of the species described as well as the English equivalents of their names. Such a list in several of the entomology text-books of a general character would be still more useful than in a book on comparative morphology. The student who knows how difficult it is to secure satisfactory information on laboratory methods will appreciate the comprehensive instructions in technique which are given as the need arises.

But more important than these incidental features in establishing the worthwhileness of *External Insect-Anatomy* as a text-book are the very obvious pains which the author has taken to make plain at every step the significance of the comparative study of insects, particularly in its relation to the matter of evolution. The inclusion of material drawn from embryology has been an effective part of this policy. As a consequence *External Insect-Anatomy* might be used with profit even in a course where the stress is laid more upon the characteristics of the several orders and less upon the comparative structure of the parts of insects, as it would shed light upon the laboratory work from a slightly different angle. During the term reference might be made to sections in different chapters dealing with the order being studied in the laboratory, and towards the end of the term a reading of the general treatments at the beginning of each chapter would make clearer the relations to one another of the orders studied and broaden the student's knowledge of insects in general.

A feature of *External Insect-Anatomy* which in no way affects the value or usefulness of its contents but which is still of considerable importance is the freedom the author has allowed himself in the formation of new compounds. Many who are mindful of the responsibility of biologists in contributing new words to the language will look askance at hybrids such as

"mesowings" and "metalegs," and object strenuously to the disregard of roots shown in the numerous compounds introduced of the type of "quaspiracles" and "quispiracles," where qua- and qui- stand for quattuor and quinque. Others who hold language in less esteem will probably argue along with the author that accuracy and conciseness are the prime essentials in a book like *External Insect-Anatomy,* and that all means to secure them are legitimate.—Paul A. Turner.

## OBITUARY.

### Edwin A. Bischoff.

Edwin A. Bischoff, a coleopterist of repute, died on December 23rd last, at the hospital in Newark, New Jersey, following an operation. Mr. Bischoff was born January 23, 1866 and became known beyond his own locality as an energetic collector of Coleoptera with the publication in 1890 of Smith's first list of the Insects of New Jersey. His records in the third list, published in 1909, covered a large part of the coleopterous fauna of New Jersey and he was thereafter recognized as the possessor of one of the largest collections in the state and of a fund of information acquired by his constant field work. Many specialists obtained part of their data from him and as one result *Thysanocnemis bischoffi* was named for him by Blatchley.

His own writings are not numerous but include "Neoclytus jouteli in Virginia" (Journ. N. Y. Ent. Soc. XXVII, 1918, p. 231).

Mr. Bischoff was a member of the Newark Entomological Society, and of the New York Entomological Society, also of several fraternal associations. His home was at 151 Maple Avenue, Irvington, where many entomologists have visited and seen his collections, remarkable for their neat arrangement as well as for the great series of specimens included. His collecting trips were made chiefly in the Newark district and the Orange Mts., but Eagle Rock, Berkeley Heights, and Lakehurst were also among his favorite haunts. His companion on many of these trips was Mr. Edgar L. Dickerson, whose death was recorded in the January number of the News.

Charles W. Leng.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTIO

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV APRIL, 1924 No. 4

CONTENTS



# The Life-History of Brephidium exilis Bdv. (Lepid. : Lycaenidae).

By KARL R. COOLIDGE, Hollywood, California.

*Brephidium exilis* Bdv., well named "The Pygmy Blue," since it is one of the smallest species of butterflies in the world, is the most abundant form of Rhopalocera in Southern California. Along the coastal region it flies in countless millions, is well distributed throughout the Mohave and Colorado Deserts, but does not invade the higher mountains to any great extent. Some idea of its abundance can be gleaned by the fact that from one patch of Australian saltbush, hardly several acres in extent, half a million perfect specimens were taken in a few weeks' time—and yet this considerable number did not diminish the status of the colony to any noticeable degree.

Wright (Butt. West Coast) was in error in stating that *exilis* in California does not occur north of Santa Barbara, since it is very common in the San Joaquin Valley as far north as Sacramento, and simply swarms in the salt marshes about San Francisco Bay.

About Los Angeles I have seen it on the wing every month of the year, but as a rule it does not appear in numbers until early July, reaching the apex of the season's flight in the hot days of September, and from the middle of November, or earlier according to the coolness of the season, rapidly diminishing.

It is severely parasitized by a Tachinid fly, specifically unidentified as yet, and the amazing thing about *exilis* here is its continued abundance in view of the vast numbers of larvae that fall victims to the parasite. As an example, on one occasion twenty-eight larvae were collected. Of these eleven were found to already contain the parasitic grub internally, its black head readily being seen laterally on thoracic segment three, or abdominal one, generally on the left side, only rarely on the right. Four others bore parasitic eggs, making a total of fifteen out of twenty-eight. In another instance fourteen larvae out of eighteen were found to be parasitized.

The parasitic egg is usually placed on one of the anterior segments, more frequently on the first or second thoracic than elsewhere. It may be briefly described as: Egg shaped, pale yellowish white, with a very delicate scarcely raised tracery of round cells, .01 mm. in diameter. Length .34 mm.; .14 mm. in diameter at the smaller end; .32 mm. at the larger end.

I once witnessed an encounter between the parasitic fly and a larva in the fourth instar. The larva was being attended by several ants when the fly alighted on the same leaf. The ants immediately became greatly excited, and as the fly endeavored to get into a position to place an egg, the ants scurried back and forth over the larva at a frenzied rate of speed. It did not appear that the ants were deliberately seeking to attack the fly, but by the hurried scamperings over the larva they soon discouraged the parasite, which after three or four fruitless attempts to oviposit flew away. The impression I received was that the ants were assuredly aware of the danger to their larva, and were certainly responsible for its being saved.

The eggs are placed everywhere on the food-plants, but more frequently on the upper surfaces of the leaves than elsewhere. Of forty-six eggs, thirty-four were on the upper sides

of the leaves, eight on the under surfaces, two on the stems, and two on the seed pods.

I have discovered eggs or larvae on the following food-plants:

*Chenopodiaceae.*

*Atriplex semibaccata* R. Br. Australian saltbush, introduced in California about thirty years ago as a forage plant, and which has now completely established itself. This is the favorite food-plant.

*Atriplex coulteri* Dietr. At Santa Catalina Island.

*Atriplex serena* Nelson. (*bracteosa* Wats.) Lamb's Tongue, a common weed in saline places.

*Atriplex canescens* (Pursh.) James. Shad-bush. On the Mohave and Colorado Deserts.

*Atriplex leucophylla* Sietr. Along the seashore.

*Atriplex breweri* Wats. A popular low hedge in Southern California.

*Atriplex patula* L. With *A. hastata* L., the food-plants in the San Francisco Bay region.

*Chenopodium leptophyllum* Nutt. A common weed in waste places. Also *C. album* L., Lamb's Quarters, a native of the Old World, but now a familiar weed in the settled parts of California.

*Solanaceae.*

*Petunia parviflora* (Lehm.) Juss. Petunia, a plant growing on margins of ponds and along streams, especially in subsaline places. I found *exilis* swarming about this at Buena Vista Lake, in Kern County.

The young larva eats its way out of the egg through a jagged hole, usually in the side, and only devours sufficient of the shell to make its exit. In the earlier stages the larvae prefer the young buds, but also eat out irregular roundish holes in the leaves. Later, they attack mainly the seed-pods, boring into them and eating out the inner contents. Pupation takes place in debris or under stones, and hibernation occurs in the pupal state.

| | |
|---|---|
| Eggs laid July 11th. | Passed third moult July 26th. |
| Hatched July 14th. | Passed fourth moult August 1st. |
| Passed first moult July 18th. | Pupated August 6th. |
| Passed second moult July 22nd. | Imagoes emerged August 10th. |

*The Egg.*—Turban-shaped, more than half as high as broad, the upper portion almost perfectly flat, sloping evenly to the central depression, the micropyle; the sides strongly convex to

the flattened base. The micropyle in a deep even round pit, .02 mm. in diameter, of a deeper green than rest of egg.

Ground color a very delicate bluish green, with the usual raised net-work white; as the embryo develops the greenish coloration becomes lost, the egg becoming a solid chalky white. The raised network on the sides divides itself into irregular subtriangular and subquadrate cells, measuring .02 mm. in their longest axes, with the cell walls .005 mm. in thickness; the usual protuberances at the angles .01 mm. in height and .015 mm. in thickness, broadly rounded. About the micropyle the net-work becomes confused, more irregular and the cells are much smaller. Base sharply flattened, of a deeper tint of green, marked by a delicate tracery of quite regular pentagonal cells. Diameter .44 mm. Height .20 mm.

*First Instar.*—Head dark chestnut brown, shining, .14 mm. in diameter. First thoracic segment pallid, with a bluish tinting.

Body finely granulated. The usual Lycaenid triangular chitinous dorsal plates with a white sheen. Series of rather high conical papillae, projecting hairs, in the following arrangement:

A suprastigmatal series, placed anteriorly on the segments, one to a segment on either side, projecting minute, crooked, clavate, densely spiculiferous hairs, .015 mm. in length. A second similar set of suprastigmatals above these, one on each side, and centrally located.

Two substigmatal papillae, an anterior with the projected hair .02 mm. in length, clubbed, crooked, densely spiculiferous; and a much larger one placed considerably below and centrally on the segment, with the hair .08 mm. in length, straight, sharp, and colorless.

A subdorsal row, one to a segment, placed centrally; the hairs from these colorless, clubbed, spiculiferous, .08 mm. in length, .009 mm. in width at the base and .01 mm. in width at the tip; these hairs closely appressed and directed caudad and slightly laterad, except on the first thoracic where they project over the head. The papillae emitting these hairs .01 mm. in height and diameter, and those of the first thoracic are dark brown.

Color of body pale lemon yellow, but as the larva feeds the original yellow coloration fades more and more, with a greenish tinge taking its place, until at the end of the instar the larva is a solid pale delicate green. Ventral surface and prolegs bright lemon yellow, at beginning of stage. Spiracles pallid, round, with a very fine brown ring, .01 mm. in diameter. A latero-dorsal row of naked fuscous lenticles, two to a segment on either side, close together, the outer the smaller. Anal segment

with a fringe of minute fuscous papillae that project fine, sharp, colorless spiculiferous hairs posteriorly, these being .11 mm. in length.

Length, at birth, .66 mm. Width at first thoracic segment, .20 mm. Width at anal segment .16 mm.

*Second Instar.*—Head dark chestnut brown, shining, .26 mm. in diameter. As before, first thoracic pallid, with a bluish tinting.

Body densely studded with dark brown tubercles projecting heavy, short, curved, densely spiculiferous hairs, clavate; these tubercles .007 mm. in height and diameter, with the arising hairs .02 mm. in height and width at the tip, but the hairs vary slightly, some being as long as .04 mm. Long, sharp, colorless hairs bordering anal segment posteriorly now .16 mm. in length on the average. On first thoracic some similar anteriorly projecting hairs, some .16 mm. in length, others but half that size. Some fine, sharp, straight hairs, colorless, .06 mm. in length, on ventral surface along base of prolegs.

Color of body pale green, excessively finely granulated with brownish atoms. Ventral surface and prolegs pale yellow green. Legs pale yellow brown, opaque. Spiracles pallid, round, .02 mm. in diameter, with a fine brown ring.

Length, 1.40 mm. Width at first thoracic .40 mm. Width at anal segment .34 mm.

*Third Instar.*—Head dark chestnut brown, shining, .34 mm. in diameter. As before, first thoracic pallid, with a bluish tinge.

Body densely studded with tubercles as before; these are mostly concolorous with the body, but some, irregularly scattered, are conspicuously dark brown. The arising hairs colorless and clavate, averaging .04 mm. in height and .02 mm. in diameter at their tips. First thoracic with a fringe of sharp, colorless hairs projecting over the head and a similar but posteriorly projecting fringe to the anal segment; these hairs are as long as .16 mm., with some shorter ones down to .08 mm.

Color of body green to gray green, with the surface finely granulated with brownish atoms. Ventral surface and prolegs pale yellowish green. Legs pale yellow brown, opaque. Spiracles round, with a fine brown ring, .025 mm. in diameter.

Length, 2.30 mm. Width at first thoracic .70 mm. Width at anal segment .54 mm.

*Fourth Instar.*—Head .44 mm. in diameter, dark chestnut brown, shining. Neck bluish green.

Body densely studded with tubercles as before; these are now dark brown, short and stout, .02 mm. in height, and .025 mm. in diameter at base. The arising hairs colorless and clavate, densely spiculiferous, varying slightly in length, but

.03 mm. in length on the average. Anteriorly projecting, colorless spiculiferous hairs of first thoracic now from .06 to .20 mm. in length. Anal segment spatulate, moderately depressed, with a fringe of colorless, spiculiferous hairs averaging .20 mm. in length.

Color of body light green, but for the various phases that may exist see under mature larva. The flattened, dorsal, triangular processes pale yellowish brown, mottled with rosaceous, and in the center of each, so as to form a broken yet conspicuous dorsal line, a heavy blotching of rosaceous. Or, these subtriangular processes may be quite pallid, with the dorsal, rosaceous line only faintly present. Anal segment usually with a rather heavy blotching of rosaceous dorsally and substigmatally. Ventral surface and prolegs bright blue green. Legs pale yellow brown. Spiracles round, pallid, with a fine brown ring, .03 mm. in diameter. Tubes and sac conspicuous, the tube cases pallid, .1 mm. in diameter, prominent, elevated to a height of .12 mm.

Length 3.9 mm. Width at first thoracic 1.04 mm. Width at anal segment .90 mm.

*Fifth Instar.*—Head .60 mm. in diameter, now a rather dull brown.

As before, body densely studded with dark brown tubercles, .025 mm. in height, giving rise to white, densely spiculiferous, crooked processes, for most part bent anteriorly. These average .04 mm. in length. Some of the basic tubercles, especially in the dorsal region, are pure white. First thoracic with a heavy fringe of colorless, spiculiferous hairs, averaging .22 mm. in length, mounted on dark brown papillae .03 mm. in height and diameter. A similar fringe of hairs, of the same length, to the anal segment. Segmental incisures deep. Surface of body finely punctate. Spiracles round, pallid, .05 mm. in diameter, surrounded by a narrow brown ring.

Color yellowish green. A bright yellow, substigmatal band, only weakly indicated, sometimes obsolete. A yellowish white, dorsal line, with a more or less pinkish tinge, not prominent, extending from the second thoracic and fading out on the anal segment. The above is the commonest coloration phase, with others as follows:

A greenish phase, with weak roseate dorsal line and no substigmatal rosaceous or yellowish line.

A greenish phase with roseate dorsal and roseate substigmatal bands well developed.

A greenish phase with dorsal line dark green and bordered by a yellowish tinge. No rosaceous either dorsally or substigmatally.

A greenish phase with roseate dorsal line well developed, but roseate substigmatal line only faintly indicated.

A dark green phase, devoid of either yellowish or rosaceous anywhere.

Prolegs and ventral surface green. Legs pale yellow brown.

Length, at maturity, 7 mm. Width at first thoracic 2 mm. Width at anal segment 1.8 mm.

*The Pupa.*—Viewed dorsally, the sides quite straight to the middle of the abdomen, swelling out only very slightly, so that the greatest breadth is at the point where a rather sudden slope begins to the well rounded, posterior abdominal segment. Viewed laterally, the thorax is highest in the middle of posterior half of mesothorax. Abdomen highest at third segment, slightly higher than the highest point of thorax.

Color light brownish yellow, of varying depths; rarely, the pupa may be a solid pale grass green. A fuscous dorsal line of varying depths and intensity, sometimes quite strong and conspicuous, again weak and broken; this, on the abdominal segments, is often pale red brown. Wing cases pale yellowish green, infuscated with some brownish dots. An abdominal, subdorsal row of rather prominent dark brown dots, quadrate or round, sometimes very heavy. On the thorax these are replaced by two concolorous streaks, projecting outward, and joined together at their furthest points.

Surface of body almost smooth, only exceedingly finely broken by a whitish tracery of scarcely raised lines. A few, minute, fuscous papillae giving rise to colorless hairs which enlarge as they proceed apically and at the extreme summit are expanded into bulbous heads. These hairs most numerous on the abdominal segments, .005 mm. in width at their bases, and though they vary slightly in height the average is .025 mm. Spiracles white, .06 mm. in length.

Length 5.5 mm. to 6 mm. Greatest breadth of abdomen 2 mm.

## An Annotated List of the Ants of Mississippi (Hym).

By M. R. Smith, A. and M. College, Mississippi.

(Continued from page 85)

Subfamily CAMPONOTINAE.

54.—**Prenolepis imparis** Say.

Holly Springs; A. and M. College; Yazoo City. This species builds its nests in clay-like soils where there is an abundance of moisture. Very characteristic earthen pellets are distributed around the nest's entrance. The workers are very fond of honey dew and are often found in attendance on insects which

excrete this substance. The writer has often seen workers whose gasters were so distended from feeding on honey dew that they were almost unable to walk. Some of the workers act as storehouses for their sisters, during periods when food is scarce, and are known as repletes. This species often enters houses in its search for food.

*P. imparis* may be distinguished from the other species of *Prenolepis* here mentioned by its larger size and by its pronounced more or less cylindrical mesonotum.

55.—**P. (Nylanderia) bruesi** Whlr.

A. and M. College. This is a much smaller species than *imparis*. Nests are built under the bark of logs or stumps, or under stones. The workers are also fond of honey dew.

56.—**P. (Nylanderia) vividula** Nyl.

A. and M. College. This ant is very closely related to *bruesi* and it is almost impossible to distinguish the two unless male forms are present. The genital appendages of the males of the two species are quite distinct showing that these cannot be the same species.

57.—**P. longicornis** Latr.

Gulfport; Biloxi. The workers of this imported species can be recognized by their slender forms and by their exceedingly long legs and antennae. These ants infest houses, stores, cafeterias, etc., but are far from being as troublesome as the Argentine ant, which is the house pest pre-eminent in Mississippi. The workers run very swiftly, darting here and there, as if devoid of any sense of general direction; this term has earned for them the name of "crazy ant."

58.—**Lasius niger** var. **americanus** Emery.

A. and M. College; Lula; Trimcane. The corn, or cotton field ant, as it is generally known, does not seem to be common in Mississippi, although collecting for it has been done in numerous localities in the state. Nests are constructed in the soil or under stones in the open. The workers are given to attending plant lice and their relation to one species, *Aphis-maidi-radicis* has attracted much attention. Because of this peculiar relation the ant is considered of economic importance.

This ant can be separated from the species given below by its much darker color and by the presence of three-jointed maxillary palpi. Workers when crushed have a very strong formic acid odor.

59.—**L. (Acanthomyops) interjectus** Mayr.

A. and M. College. This is the largest ant of the subgenus *Acanthomyops*. Nests are built in the soil under stones or logs. The workers are also fond of attending subterranean plant lice, mealy bugs, etc. The ants seem to shun light and are never seen on the surface unless unearthed or exposed.

*L. interjectus* can be distinguished from *americanus* by its six-jointed maxillary palpi, its yellow color, its shining appearance and the presence of a peculiar lemon verbena-like odor.

60.—**Formica pallide-fulva** Latr.

Tupelo; A. and M. College. This ant nests in the soil under stones or in the open in fields and pastures, seeming to prefer a clay, or a clay loam soil. The workers are very timid and cowardly and are made slaves of by other species of *Formica*. They feed largely on insects but are also fond of honey dew.

This pale yellow species can be easily separated from the other two forms mentioned under this genus. It differs from the subspecies *schaufussi* in being more slender and less robust and in lacking the hairs on the gular and petiolar borders. *F. subsericeae* is a black species which is densely covered with a silk-like pubescence.

61.—**F. pallide-fulva** subsp. **schaufussi** Mayr.

A. and M. College. The workers of this form have the same habits as those of the species. It is also made slaves of by other species of *Formica*.

62.—**F. fusca subsericeae** Say.

Caesar. This species does not seem to be common in Mississippi, in fact it is much less common than the two preceding species. It has habits similar to those species and is made a slave of by other species of the genus.

63.—**Camponotus castaneus** Latr.

Mt. Olive; Ocean Springs. This large, yellowish, or castaneous colored species lives in the soil under stones in open wood-

lands. The workers are rather timid and probably nocturnal. This species is fond of honey dew but no doubt feeds on insects also.

*C. castaneus* is easily distinguished from other ants by its large size and by the more or less uniform yellowish or castaneous color of all the various phases.

64.—**C. castaneus** subsp. **americanus** Mayr.

Oakland; Neshoba. This subspecies has the same habits as *castaneus*. The workers can be distinguished from those of the species by the dark colored head, the remainder of the body being a uniform yellowish or castaneous color.

65.—**C. herculeanus** subsp. **pennsylvanicus** DeGeer.

"The carpenter ant" is widely distributed throughout the state and is one of the most common ants in Mississippi. Nests are built in more or less faulty or decayed trees, the ants sometimes simply honey-combing the wood with their galleries and chambers. McCook states that a queen is able to establish a nest and raise her first brood unaided. Workers are very fond of honey dew and are often found in attendance on plant lice, tree hoppers, etc.

The workers of this ant can be recognized by their large form, their black color and by the golden hairs and pubescence on their bodies.

66.—**C. herculeanus** subsp. **pennsylvanicus** var. **ferrugineus** Fabr.

Oakland; Neshoba; A. and M. College. This is a beautiful color variety of *pennsylvanicus* which has similar habits but not quite so wide a distribution. In this variety the workers have the thorax, petiole, coxae, femora, and base of first gastric segment yellowish ferruginous; sometimes the pronotum and the mesonotum are black. The other portions of the body are black, with the exception of the funiculi, mandibles, anterior border of head, tibiae and tarsi which are deep red.

67.—**C. socius** Roger.

Waynesboro; Benoit. This imported South American species has been found at the above named localities in Mississippi. The

writer has seen specimens of this ant in Dr. Wheeler's collections from Florida, Georgia, North Carolina and Alabama. Evidently it is spreading throughout the Southern States, for when Dr. Wheeler published his paper on the ants of the genus *Camponotus* in 1910, this species was then only known from Florida. Nothing is known concerning the nesting and other habits of *socius*.

The major worker has a ferruginous red head, the mandibles and scapes are darker, with the anterior border of clypeus and cheek black. The gaster is black with golden yellow posterior borders to each segment and a broad transverse golden band on the first and another at the base of the second segment. Because of its very distinct coloration one has no difficulty in separating this from any of the other species of *Camponotus* here mentioned.

68.—**C. caryae** Fitch.

This species is widely distributed throughout the state. Nests are constructed under the bark of trees, in twigs, or occasionally, in galls. The nests are rather small and contain very few individuals as compared with nests of other species of *Camponotus*. The workers are very fond of honey dew and may be found crawling over the trees in search of this substance. They are rather timid and hard to capture. *C. caryae* and its various subspecies and varieties are all similar in that the workers have the clypeus cut out, or emarginate in the middle.

The workers are usually shining black, but occasionally some specimens show considerable red on the appendages, the articulation of the joints, etc.

69.—**C. caryae** var. **minutus** Emery.

This is a smaller and paler form of the species. The coloration is highly variable. The habits of the two are the same.

The worker major differs from that of *caryae* in that it is smaller and that it possesses a reddish, or yellowish, thorax and petiole. The legs and antennae are paler and the mandibles, sides and lower surfaces of the head red or brown.

70.—**C. caryae** var. **decipiens** Emery.

Louisville; Starkville; A. and M. College. These ants have

been found nesting in the twigs of fig and white ash, also in galls on oak trees. The workers have reddish yellow heads and thoraces and black abdomens. *Decipiens* bears a close resemblance to *rasilis* in color, but is smaller than this subspecies and has much darker appendages. The gaster is black with pale yellow margins to the segments.

71.—**C. caryae** subsp. **rasilis** Whlr.

Starkville. As stated above, this subspecies bears a close resemblance to the variety *decipiens,* but is larger and of a lighter yellowish red color, without the noticeable infuscation on the legs, antennae and head of the worker. Nests are made in galls or in twigs of trees. Occasionally, the workers invade houses, showing a decided fondness for sweets such as syrup, jams, sugar, etc.

72.—**C. caryae** subsp. **rasilis** var. **pavidus** Whlr.

Starkville; Sibley. Nests of this variety have been found under the bark of a dead oak twig and in the stem of elder. The workers of this variety are similar to those of *rasilis* in the color of the head, thorax, petiole and appendages, but the gaster is yellow at the base. The yellow of the gaster may cover all of two segments or only the base of the first segment.

73.—**C. caryae** var. **pardus** Whlr.

The workers of this variety are small, averaging about 5.5 mm. In color they are very variable, even specimens from the same colony showing a wide variation in this respect. Typical specimens have dark brown, or black heads, with ivory yellow thoraces which are spotted with brown, and the base of the gasters often banded with yellow.

74.—**C. (Colobopsis) impressus** Roger.

A. and M. College. A nest of this species was found in a pecan twig. The ant probably nests in the twigs of other plants also. This and all other forms of the subgenus *Colobopsis* can be distinguished by the truncate head of the soldier form.

*C. impressus* can be distinguished from the other two species mentioned here by the shape of the soldier's head, the sides of which are distinctly parallel.

75.—**C. (Colobopsis) mississippiensis** Smith.

Tupelo; Starkville; A. and M. College; Sibley. This species has been found nesting in the twigs of white ash and in galls on red oak. It is the most common species of *Colobopsis* in this section of Mississippi. The workers have been observed to feed on honey dew.

*C. mississippiensis* can be distinguished from *impressus* by the shape of the head of the soldier, the sides being divergent anteriorly; and from *fraxinicola* by the anterior portion of the head being deeply concave and sharply margined, while that of *fraxinicola* is blunt with the clypeus projecting above the general truncated surface.

76.—**C. pylartes** subsp. **fraxinicola** Smith.

A. and M. College; Starkville. This species also nests in the twigs of white ash. It is not as common a species of *Colobopsis* in this locality as *misssissippiensis* but is more common than *impressus*.

## Notes on Texas Sarcophagidae (Diptera).

By H. J. Reinhard, Texas Experiment Station, College Station, Texas.

This paper includes a list of Sarcophagidae collected at College Station and a number of other points in the southern and western sections of the State. More extended collections will undoubtedly bring to light many additional species not listed here. Authentic records on the distribution of the Sarcophagidae within this State are extremely meagre, and the following list is published as a preliminary contribution to the present knowledge of this important family of muscoid flies. Grateful acknowledgment is made to Dr. J. M. Aldrich for making determinations of several species, and to all others who have assisted in collecting material.

Camptops unicolor Ald. College Station, common, April-October.

Camptopyga aristata Ald. Houston, abundant, May, 1921.

Hypopelta scrofa Ald. College Station, 4 specimens, March-November, 1921.

STHENOPYGA GLOBOSA Ald. College Station, abundant, April-October.

SARCOPHAGA n. sp. Sonora, 2 specimens, February, 1922 (Dr. D. H. Bennett), Aldrich determination.

S. ACULEATA Ald. College Station, abundant, June-October; Balmorhea, October, 1921, (C. S. Rude).

S. ALCEDO Ald. College Station, 3 specimens, October, 1920, May-July, 1923.

S. AMPULLA Ald. Dallas, April, 1914, (Aldrich) Sarc. and Allies, p. 153.

S. ANGUSTIFRONS Ald. College Station, 2 specimens, October, 1916.

S. ASSIDUA Walk. College Station, very common, March-November.

S. AUSTRALIS Ald. El Paso, 2 specimens, August, 1923, (C. S. Rude); Sonora, February, 1922, (Dr. D. H. Bennett).

S. BISHOPPI Ald. Crystal City, July, 1914, (Aldrich) Sarc. and Allies, p. 260.

S. BULLATA Park. College Station, abundant, April-November.

S. CIMBICIS Tns. College Station, 3 specimens, May, 1919, October, 1921.

S. CISTUDINIS Ald. College Station, 1 specimen, April, 1921.

S. COMMUNIS var. OCHRACEA Ald. College Station, common, April-September.

S. DAVIDSONI Coq. Midland, November, 1914, (Aldrich) Sarc. and Allies, p. 100.

S. FALCULATA Pand. Dallas, (Aldrich) Sarc. and Allies, p. 207.

S. FLAVIPES Ald. College Station, 4 specimens, October, 1920-1.

S. GALEATA Ald. College Station, 1 specimen, October, 1921.

S. HAEMORRHOIDALIS Fall. College Station, common, April-November.

S. HELICIS Tns. College Station, very common, March-November; Balmorhea, October, 1921, (C. S. Rude).

S. HUNTERI Hough. College Station, fairly abundant, May-October; Balmorhea, October, 1921, (C. S. Rude).

S. IMPAR Ald. College Station, common, March-July; Houston, May, 1921.

S. JOHNSONI Ald. Galveston, (Aldrich) Sarc. and Allies, p. 165.

S. KELLYI Ald. College Station, abundant, May-June; Sonora, February, 1922, (Dr. D. H. Bennett).

S. LATISETOSA Park. College Station, 1 specimen, October, 1921; Laredo, Duval County, Marathon, February-May, 1922, (C. S. Rude).

S. MARGINATA Ald. College Station, 2 specimens, May-July, 1923.

S. MELAMPYGA Ald. College Station, abundant, April-June.
S. OPIFERA Coq. College Station, 3 specimens, May-July, 1917, November, 1919.
S. PACHYPROCTA Park. Laredo, 1 specimen, May, 1922, (C. S. Rude).
S. PECTINATA Ald. College Station, fairly abundant, April-November.
S. PELTATA Ald. College Station, 1 female, June, 1919, referred here doubtfully by Dr. R. R. Parker.
S. QUADRISETOSA Coq. College Station, common, April-November; Houston, May, 1921; Kirbyville, July, 1922, (C. S. Rude).
S. ROBUSTA Ald. College Station, abundant, April-November; Sonora, August-October, (Dr. D. H. Bennett).
S. RUDIS Ald. College Station, 1 specimen, May, 1922.
S. RUFIVENTRIS Wied. College Station, abundant, June-November.
S. SALVA Ald. College Station, common, May-November.
S. TUBEROSA var. SARRACENIOIDES Ald. College Station, very common, April-September.
S. SINGULARIS Ald. College Station, 2 specimens, October, 1920, April, 1922.
S. SULCULATA Ald. Balmorhea, 1 specimen, October, 1921, (C. S. Rude); Sonora, October, 1920, (Dr. D. H. Bennett).
S. TEXANA Ald. Dilley, 1 specimen, May, 1920.
S. UTILIS Ald. College Station, abundant, April-October.
S. XANTHOPYGA v. d. W. College Station, common, July-October. Assigned here doubtfully since this determination by Coquillett has not been verified by comparison with the type.

## Notes on the Judas Tree Leafhopper, Erythroneura aclys McAtee in New Jersey (Homop.).

By HARRY B. WEISS and ERDMAN WEST,
New Brunswick, New Jersey.

This species* was noted at Kingston, New Jersey, on August 10, at which time thousands of adults, many first, second and third stage nymphs and a few fourth and fifth stages were infesting a specimen of Judas tree or red-bud (*Cercis canadensis* L.) growing on the front lawn of a householder. Nearly

*Identified by Mr. C. E. Olsen.

every leaf on the tree was white from the combined attacks of the nymphs and adults and an adjacent specimen of the mist tree also showed some injury presumably from adults which were present. At this date a brood of adults was well under way and many eggs were found. The eggs were placed anywhere just under the tissue of the lower leaf surface, but usually close to a mid or side vein. There appeared to be no regularity in their deposition and many were found between the veins, near the leaf base, edges, etc. Each egg showed as a little oblong, slightly curved, greenish swelling or blister on the lower surface. After hatching the blisters collapse and the tissue turns brown at the spot occupied by the egg.

The nymphs inhabit the lower leaf surfaces, feeding singly or in loose colonies of many individuals. On August 23, the infested tree was visited again and many adults were found but comparatively few nymphs. On September 19, the number of adults had decreased and only a few last stage nymphs remained. At this date many adults were found resting on the trunk of the tree and several were found under loose bark. It is supposed, therefore, that the species hibernates as an adult. On October 10, fewer adults were found on the leaves, no nymphs remained and several adults were noted again under loose bark. The following descriptions indicate the development which takes place from egg to adult.

*Egg.* Length 0.52 mm. Width 0.15 mm. Whitish, translucent, subcylindrical, broadly rounded at both ends, egg slightly curved when viewed laterally.

*First Nymphal Stage.* Width of head including eyes 0.18 mm. Length about 0.8 mm. Whitish, form narrow, elongate. Head triangular, broadly rounded, almost truncate anteriorly. Anterior truncated portion bearing several fine hairs. Eyes prominent, lateral, red, consisting of numerous, distinct ommatidia. Antennae whitish, about three-fourths as long as body; first segment short, subcylindrical, second segment subcylindrical, slightly longer than first, third segment very long, whiplike, swollen at base and tapering to a fine point. Thorax as broad as head excluding eyes, sides subparallel. Prothorax and mesothorax subequal in length. Metathorax slightly less in length. Slight constriction between thorax and abdomen. Second abdominal segment widest, remainder gradually taper-

ing to anal segment which is acutely pointed or tube-like. Legs whitish, comparatively long. Rostrum reaching almost to third pair of legs.

*Second Nymphal Stage.* Width of head including eyes 0.26 mm. Length about 1.1 mm. Whitish with lemon-yellow tinge; form narrow, elongate. Head triangular, broadly rounded or truncate anteriorly, anterior edge bearing two fine setae. Eyes prominent, lateral. Prothorax as broad or slightly broader than head excluding eyes and slightly longer than mesothorax. Meso- and metathorax similar in shape and slightly wider than prothorax; anterior and posterior edges broadly curved. Meso- and metathorax each subcrescent-shaped with rounded points of crescents extending posteriorly. Constriction between thorax and abdomen more pronounced. Abdomen broadest at second or third segment, gradually tapering to an acute point at ultimate segment. Abdominal segments for the most part subequal in length. Legs long, narrow. Antennae about two-thirds as long as body. Rostrum reaching to between the second and third pair of legs.

*Third Nymphal Stage.* Width of head including eyes 0.31 mm. Length about 1.5 mm. Similar in shape and color to preceding stage. Constriction between thorax and abdomen very pronounced. Antennae about one-half as long as the body. Posterior extensions of mesothorax and metathorax quite pronounced, those of mesothorax subparallel or slightly diverging and those of metathorax widely diverging, the ends extending slightly beyond the extensions of the mesothorax.

*Fourth Nymphal Stage.* Width of head including eyes 0.41 mm. Length about 1.8 mm. Similar in shape and color to preceding stage except that extensions of mesothorax and metathorax have developed into pronounced wing pads; those of mesothorax slightly subparallel or slightly divergent and those of metathorax widely divergent or extending considerably beyond the body line. Antennae less than one-half as long as body. Rostrum extending to between the second pair of legs.

*Fifth Nymphal Stage.* Width of head including eyes 0.51 mm. Length about 2.4 mm. Whitish with lemon-yellow tinge; form narrow, elongate gradually tapering posteriorly. Antennae white, about one-third as long as body, three-segmented, first segment short, cylindrical, second segment slightly longer than first, third segment whip-like, very long, swollen at base and tapering to a fine point. Head triangular, broadly rounded anteriorly and bearing two setae on anterior margin and several smaller setae between the marginal setae and the antennae. Eyes prominent, lateral. Prothorax slightly narrower than the

width of head including eyes, sides parallel, length slightly less than one-half width. Mesothorax slightly longer than prothorax, wing pads long and narrow extending beyond body line laterally and posteriorly to slightly beyond the middle of the third abdominal segment. Metathorax slightly less than one-half as long as mesothorax, with narrow wing pads extending laterally beyond the body line and posteriorly to the beginning of the fourth abdominal segment. Abdomen widest at about the third segment and gradually tapering to posterior end. Segments subequal in length except the first, which is shorter, and the last one, which is longer. Last segment bearing several hairs which are short. Legs long, narrow, tibiae bearing minute, short spines which are most pronounced on the third pair of legs. Tip of rostrum extending to the second pair of legs.

*Adult.* This was described by McAtee from specimens collected at Plummer's Island, Maryland, December 21, 1913 (Trans. Amer. Ent. Soc. xlvi, p. 290, 1920). In past years Mr. E. L. Dickerson has collected this species on Judas trees in several nurseries in the north-eastern part of New Jersey.

## Two Little Known Leaf-miners of Apple (Lepid.: Tineidae; Col.: Curculionidae).

S. W. Frost, State College, Pennsylvania.

There are two species of leaf-miners on apple which have received little attention in literature. One of these belongs to the order Lepidoptera, the other to the Coleoptera. The habits of these have been referred to only briefly. Both are pests on apple, working chiefly on the water sprouts and more succulent growth.

### Lyonetia speculella Clem.

*Lyonetia speculella* Clem.[1] is the more interesting of the two, differing considerably in habits from the numerous other leaf-miners which are more common on apple. The only record of food plants is that of Busck (1904)[2] where he states that a series of specimens was bred by Dr. Dyar at Kaslo, British Columbia from *Ceanothus, Prunus* and *Betula*. Engel (1908)[3]

[1] Syn. *L. nidifincansella* Pack., *gracilella* Cham., *apicistrigella* Cham. The determination of the species was kindly made by Miss Annette Braun.

records the species as rare in the woods in the vicinity of Pittsburgh, Pa. The writer has found the small miner abundant in Eastern Pennsylvania during recent years.

The larvae confine themselves to the leaves where they mine during their entire larval stage. They make small irregular blotch mines on the upper surface of the leaf which are slightly visible from the lower surface. Five or six of these mines may be found on the same leaf. The mature dried mines distort the leaf considerably.

The larvae are cream in color, distinctly constricted between the segments. The head is slightly depressed with the front triangle not extending to the vertical triangle. The thoracic legs are present, the pro-legs are rudimentary and represented on the third, fourth, fifth and sixth abdominal segments by a uniserial circle of crochets.

The full-grown larva abandons the mine and pupates in a delicate white silken cocoon fastened by means of a few silken threads to the under side of the leaf. The pupa is light brown in color and superficially resembles the pupa of *Ornix geminatella* Pack., which also mines the leaves of apple. The antennae project considerably beyond the tip of the abdomen. The anterior end of the pupa is prolonged into two sharp horns.

Several adults were reared. These issued from August 18th to August 25th. The moths are beautiful silvery white in color with a dark spot at the tip of each fore-wing. Miss Braun states that the writer's specimens are unusually light in color and that they are usually well suffused with fuscous.

*Lyonetia* is apparently a leaf-mining genus. The habits of the known species bear this out. Meyrick (1895)[4] speaking of the genus says "larva mining in leaves of trees and shrubs. Pupa in an elongate white cocoon suspended by threads from its ends." Packard (1874)[5] described *Lyonetia saccatella*, feeding from a case rather than mining the leaves. This species, however, was subsequently transferred to the genus *Coptodisca* and made a synonym of *splendoriferella* Clem. The habits of four other species of *Lyonetia* are well known. Two of these occur in Europe; *L. clerkella* L., mining *Betula alba, Prunus cerasus, Pyrus, Crataegus* and *Sorbus,* and *L. prunifoliella*

Walsh., mining *Betula* and *Crataegus,* while two occur in America; *L. latestrigella* Walsh. and *L. candida* Braun. which have been bred as miners on the leaves of *Rhododendron.*

The Apple Flea-weevil, **Orchestes pallicornis** Say.

This small Curculionid has been found at times as abundant as the foregoing species. It was first recorded by Forbes (1911)[6] from Illinois as a pest on apple, cherry and other plants. Blatchley and Leng (1916)[7] give the distribution as ranging from Nova Scotia and Quebec through New England to Oregon and South to Texas. In the state collection at Harrisburg, Pennsylvania, there is a long series of specimens from Pine Grove and Hummelstown, Pa., (Knull), Lakehurst and New Brunswick, New Jersey, (Knull), Laurel Springs, N. J., (Daecke), Delaware, Ohio, (Houser) and Chillicothe, Ohio, (Guyton).

The larvae mine the leaves of apple, cherry, elm and alder. Each larva makes a separate mine which is at first linear but later takes the form of an irregular blotch. The full-grown larva transforms in a gall-like pocket within the leaf. The adults feed on the foliage eating out small holes. They resemble flea-beetles more than Curculionids because their hind legs are enlarged and they are powerful jumpers. Records have been made of the adults feeding on the flowers of *Amelanchier* and the leaves of willow.

According to Blatchley and Leng (1916),[7] most of the species of the genus *Orchestes* are miners in the leaves of willow. The habits of another species *Orchestes rufipes* Lec., are well-known, the larvae mining the leaves of *Salix lucida* and *Salix pentandra.* There are two species in Sweden *O. populi* L. and *O. fagi* L., both miners on poplar. It is very probable that all the species of this genus are leaf-miners.

### Literature cited.

[2] Busck, August. Proc. U. S. Nat. Mu. 27:773, 1904.
[3] Engel, Henry. Ann. Carnegie Mu. 5:133, 1908.
[4] Meyrick, E. Handbook of British Lepidoptera, 1895.
[5] Packard, A. S. Guide to the Study of Insects, 1874.
[6] Forbes, S. A. Twenty-sixth Rep. Nox. Ins. Ill. :83, 1911.
[7] Blatchley, W. S. & Leng, C. W. Rhynchophora of N. E. America: 281, 1916.

# Rearing Records of Pollenia rudis Fab. (Dipt., : Muscidae).[1]

By G. L. GARRISON, Bureau of Entomology, Washington, D. C.

The larva of *Pollenia rudis,* Fab., was discovered by Keilin[2] in 1908 and found parasitic on the earthworms, *Allolobophora chlorotica* and *A. rosea.* In Paris he found that eggs were deposited during August or early September on the soil. They hatched after five to seven days and the larva, when it found an earthworm, gained entrance to the body through the male genital opening located on the ventral side of the 15th segment. From September or October to the following May or June the *Pollenia* larvæ were found in a dormant state in the body cavity of the genital segments, i.e. from the 9th to the 12th or even as far back as the 16th. In May or June the larva became active, worked it way toward the anterior end of the worm, where it pierced with its posterior end the prostomium of the worm and thus exposed its stigmata. It continued to feed and gradually destroyed the worm, working backward as fast as the segments were destroyed. Pupation occurred usually from the 5th to the 25th of June, and the pupal stage had a duration of from 32 to 45 days, emergence occurring from the middle of July to the first part of August.

He found only one generation per annum, but admits the possibility of the existence of a summer generation.

The larva of *Pollenia rudis* was found in this country by Webb in June, 1916. Webb and Hutchison determined that the life history of this fly in Washington is quite different from that found by Keilin in Paris[3]. They found no indications of a dormant period during which the larvæ remain practically motionless in the body cavity of the worm.

---

[1]This work was conducted under the supervision of Mr. J. L. Webb.

[2]Keilin, D. "Recherches sur les larves de Dipteres Cyclorhaphes," Bul. Sci. de la France et de la Belgique, T. XLIX, 7e Serie, 30th. Dec., 1915.

[3]A Preliminary Note on the Bionomics of Pollenia Rudis, Fabr., in America. Proc. Ent. Soc. of Washington, Vol. XVIII, No. 3, pp. 197-199, 1916.

Their record of summer generations indicate the following developmental periods.

| | |
|---|---|
| Egg stage ........................ | 3 days |
| Larval stages ........................ | 13-22 " |
| Pupal stages ........................ | 11-14 " |

Total developmental period 27-39 days and the tentative conclusion was reached that there are four broods or generations in the latitude of Washington, D. C.

Further work was started at Drummond, Maryland, during the Spring of 1922 by the writer to obtain additional information along these lines but flies were not caught in sufficient numbers to work with until late in the season.

The cages used were 16 inches high by 12 inches square. The top, door and three sides were covered with fine mesh screen wire while the framework was of zinc. They were kept on the shelves of a screened insectary and were protected from the direct rays of the sun, while being under conditions as near those of outdoors as possible.

*Pollenia* caught in traps baited with banana were released in cages with a cigar box containing a small amount of soil, which was kept slightly moistened throughout the time of observation, and a piece of banana for food. As soon as eggs were found all flies were removed and a known number of earthworms, *Helodrilus* (*Allolobophora*) *chloroticus,* free from parasitism, were placed on the soil and daily watch kept for emergence. The following tables give the result of these experiments:

EMERGENCE FROM CAGE 1, LOT 2

| Date Eggs found | No. eggs | No. worms introd'c'd | Date emerged | ♂ | ♀ | Total | No. days egg to adult emerg. |
|---|---|---|---|---|---|---|---|
| Aug. 30-31 | 30 | 30 | Oct. 3 | 1 | 0 | 1 | 34 |
| Aug. 30-31 | 30 | 30 | Oct. 4 | 1 | 0 | 1 | 35 |
| Aug. 30-31 | 30 | 30 | Oct. 7 | 1 | 0 | 1 | 38 |

EMERGENCE FROM CAGE 2, LOT 2

| Date Eggs found | No. eggs | No. worms introd'c'd | Date emerged | ♂ | ♀ | Total | No. days egg to adult emerg. |
|---|---|---|---|---|---|---|---|
| Sept. 1-2 | 15 | 15 | Oct. 7 | 1 | 0 | 1 | 36 |
| Sept. 1-2 | 15 | 15 | Oct. 9 | 2 | 2 | 4 | 38 |

EMERGENCE FROM CAGE 3, LOT 1

| Date Eggs found | No. eggs | No. worms introd'c'd | Date emerged | ♂ | ♀ | Total | No. days egg to adult emerg. |
|---|---|---|---|---|---|---|---|
| July 13 | 20 | 20 | Aug. 10 | 0 | 1 | 1 | 28 |

*Experiment* 1.

On August 18, A.M., a petri dish containing a small amount of moist soil was placed in a cage with 5 ♂ and 5 ♀ *Pollenia.* As soon as eggs were found worms were placed with them. The following table gives the result of this experiment:

| Date Eggs found | No. eggs | No. worms introd'c'd | Parasitic worm found | Larva had entered soil | Remarks |
|---|---|---|---|---|---|
| Aug. 21 | 25 | 10 | Aug. 29 | Sept. 9 | Did not emerge |
| | | | Aug. 30 | —— | Worm soon died |
| | | | Aug. 30 | —— | Worm soon died |
| | | | Aug. 31 | —— | Worm soon died |

*Experiment* 2.

From September 2 to September 5, 9 male and 29 female *Pollenia* were released in this cage with a small box of moist soil and banana for food. On September 6 there were 2 males and 9 females alive in cage when 30 eggs were found and 15 worms placed with them. Seven days later at the first examination of worms, one was found parasitised but 3 days later it had dried up and larva was not seen again.

*Experiment* 4.

| Date Eggs found | No. eggs | No. worms introd'c'd | Parasitic worm found | Larva had entered soil | ♂ Pollenia had emerged |
|---|---|---|---|---|---|
| Sept. 8 | 27 | 10 | Sept. 14 | Sept. 25 | Oct. 21 |

Twenty-seven eggs were found in this experiment one day after 3 male and 20 female *Pollenia* were released in cage. Six days later, at the first examination, one parasitised worm was found. Eleven days from this time larva had entered soil, and 26 days from the time it had entered soil 1 male *Pollenia* had emerged.

*Experiment* 6.

On September 12, 4 male and 18 female *Pollenia* were released in a cage with a tin salve box of moist soil, and banana for food. One day later 40 eggs were found and 15 earthworms placed with them. Seven days from the time eggs were found, at the first examination, 3 parasitised worms were found. Thirteen days from the time eggs were found the fourth parasitised worm was found. No emergence from this lot.

In all cases the eggs were laid singly and partly hidden in the soil.

The larvæ were found in different parts of the body of the worm and do not appear to be confined to any particular point.

*Trapping Pollenia rudis.*

On June 6, a fly trap baited with bananas was placed in the open field and on June 27 a second trap was put in operation. Beginning June 26 collections were made early each morning, when the flies were stupefied with chloroform and removed from the traps. It was found that more flies were caught when the trap was raised about 8 inches from the ground.

The first *Pollenia* were removed from the trap on June 10 at the second collection.

In July 277 *Pollenia* were caught in both traps or 117 ♂ and 160 ♀. The highest catch, 39, was on July 5th.

In August 314 *Pollenia* were caught; 190 ♂ and 124 ♀. Largest catch 137, August 26-27, Saturday and Sunday collection.

In September 368 *Pollenia* were caught; 151 ♂ and 217 ♀. Largest catch, 77, September 9-10, Saturday and Sunday collection.

In October 938 *Pollenia* were caught; 473 ♂ and 465 ♀. Largest catch, 120, September 10.

In November 1026 *Pollenia* were caught; 494 ♂ and 532 ♀. Largest catch, 280, November 11-12, Saturday and Sunday collection.

TOTALS OF *POLLENIA* CAUGHT BY MONTHS

| Month | ♂ | ♀ | ♂ and ♀ |
|---|---|---|---|
| July | 117 | 160 | 277 |
| August | 190 | 124 | 314 |
| September | 151 | 217 | 368 |
| October | 473 | 465 | 938 |
| November | 494 | 532 | 1026 |
| Season | 1425 | 1498 | 2923 |

## A New Species of Anomala (Coleop. Scarabaeidae.)*

By Wm. P. Hayes, and J. W. McColloch, Kansas Agricultural Experiment Station.

During the course of the studies of white grubs in Kansas by the writers, an apparently new species of *Anomala* has been found which is of considerable economic importance. A

*Contribution No. 320 from the Entomological Laboratory, Kansas State Agricultural College. This paper embodies some of the results of Project 100 of the Kansas Agricultural Experiment Station.

description is presented at this time in order that reference can be made to the species in a forthcoming publication on its life history.

**Anomala kansana** new species.

♂. Color dorsally dark brown to piceous with lateral margins of elytra flavo-testaceous; ventrally fusco-testaceous to rufo-testaceous with faint, greenish metallic lustre; legs rufo-testaceous proximally, piceous distally; antennæ fusco-testaceous. *Size* 11-12.5 mm. long, 5-6.75 mm. wide.

*Head* piceous with faint purple to æneous iridescence. Labrum concealed dorsally by clypeus. Clypeus strongly reflexed apically, angles broadly rounded, about twice as wide as long, closely and confluently punctured, producing a dense rugosity on disk, less coarsely punctured on caudal margin. Clypeo-frontal suture slightly curved, with tentorial depressions laterally. Front slightly flattened, coarsely and confluently punctured, vertex more sparsely punctured, punctures not confluent, front and vertex with purple to æneous iridescence.

*Prothorax* unicolorous, piceous to rufo-piceous. Size 5.75 mm. wide, 3.25 mm. long. Surface evenly punctured on disk, punctures larger than those of vertex but sparser, becoming more confluent laterally. Faint median, depressed line anteriorly, in some specimens extending caudad at least half the length of prothorax, in others almost obliterated; near each lateral margin a rather strongly depressed, rounded area; sides evenly and strongly arcuate, converging in apical half of margin; angles rather strongly rounded, posterior pair more rounded than anterior angles. Basal bead entire.

*Scutellum* semicircular, punctures irregular, about equal in size to those of prothoracic disk, posterior margin impunctate, forming a smooth margin. *Elytra,* in type, piceous with posterior two-thirds to three-fourths of lateral and caudal margins flavo-testaceous, extending slightly anteriorly on suture, varying as noted below, lateral margins subparallel, becoming more rounded apically, punctures on disk strongly rugose. Striæ moderately coarse, deeply impressed and almost confluently punctured, first interval finely and sparsely punctuate; second interval wide and confusedly, rugosely punctate, narrowing toward the apex; in some specimens the punctures form a median sulcus apically; third interval narrow and faintly punctate; fourth interval almost as wide as second and confusedly punctate.

*Pygidium,* shining, rufo-testaceous, finely and densely punctate, punctures shallow and somewhat arcuate.

Tarsi of posterior legs longer than tibia by length of tarsal claws, femur and tibia about equal. Upper claw of first and second pair cleft, rami equal in length with one ramus slightly stouter in male. In female one ramus slightly shorter and stouter than other ramus.

♀. Differs from male in having the club of antenna shorter than the stem, in the male longer than the stem. The eyes of the female are less prominent and separated by about twice their width, while in the male, eyes are convex and separated by less than twice their width.

*Variations.* The normal piceous color of the elytra is replaced by spots, splashes or streaks of testaceous coloring.

*Systematic position.* This species belongs in the *flavipennis* section as defined by Casey (1914)[1] and is closely related to *flavipennis* Burm., but is readily distinguished by its larger size, its darker thoracic coloration and the characteristic markings of the elytra.

*Material.* Described from 125 specimens. *Type* in the collection of the Kansas State Agricultural College. Paratypes will be deposited in United States National Museum. Described from specimens collected and reared during June and July. Locality, Riley and Clay Counties, Kansas.

## A New Lycaenid (Lep.) from the Pacific Coast.

By CHAS. L. FOX, San Francisco, California.

**Plebeius shasta comstocki** new variety.

Separable from *shasta* and *minnehaha* by the much broader border on the outer margin of the upper side of the primaries in the male, brighter shade of color of the upper side of the female, different ground color and absence of white markings on the under side of both male and female.

♂.—Expanse 23 mm. *Upper side.* Primaries: color purplish blue; broad fuscous border on outer margin with slight ferruginous tinge twice as broad as in *shasta* averaging 2.5 mm. in width; fringes white, inside a narrow black line; black, reniform, discal spot. Secondaries: same color as primaries; fuscous border on outer margin half the width of that on primaries,

[1]Casey, T. L. A Revision of the American species of Rutelinae, Dynastinae and Cetoniinae. Mem. Coleop. VI. 1915. pp. 1-394.

surmounted by row of dull orange lunules, the second from the angle larger and more conspicuous, partially enclosing black spots, followed on outer margin of each by a trace of white scales; fringes white; black discal spot smaller than on the primaries.

*Under side.* Primaries: color brownish gray (grayish white in *shasta*), bluish tinge at base; black spot near base; small inconspicuous spot above and below discal spot close to costal margin; transverse sinuous row of black spots midway between discal spot and outer margin bending most strongly towards the costal margin; beyond this a less conspicuous row of submarginal spots, followed by a row of still fainter spots becoming obsolete towards the tip; a distinct fine black line at base of fringes; fringes light brown becoming paler outwardly. Spots not distinctly edged with white as in *shasta* and *minnehaha*. Secondaries: same color as primaries; three spots more or less conspicuous near base; discal spot and transverse sinuous row of spots scarcely darker than the ground except large black spot close to costal margin; other margin with a series of round black spots bordered with pale metallic scales, each spot surmounted by a yellow lunule which is again surmounted by a small dark lunule; lacking accompanying row of white triangular spots found in *shasta* and *minnehaha;* fringes and marginal line as in primaries.

♀.—Expanse 23-25 mm. *Upper side.* Primaries: color a brighter reddish brown than in *shasta,* slightly tinged with blue at base; a narrow dark border on outer margin; black discal spot at apex of cell; fringes whitish brown. Secondaries: somewhat darker in color; discal spot inconspicuous; submarginal row of yellow lunules surmounting black spots brighter and more conspicuous than in *shasta.*

*Under side.* Primaries and secondaries similar to the male except that markings are more conspicuous and ground color brighter, having a slightly yellow hue. The white markings of *shasta* and *minnehaha* wanting.

Described from 26 males and 9 females taken at Glacier Point, Yosemite National Park, California, July 11, 1923, by Mr. J. D. Gunder.

Named for Dr. John A. Comstock, Director of the Southwest Museum, Los Angeles, California.

*Type:* Male, and *allotype,* female, in the collection of Mr. J. D. Gunder, Pasadena, California. *Paratypes* in the collections of the California Academy of Sciences, San Francisco, the Southwest Museum, Los Angeles, and Mr. J. D. Gunder.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., APRIL, 1924.


## PROFESSOR JACQUES LOEB.

Professor Jacques Loeb, physiologist and general biologist, who died at Bermuda, February 12, 1924, was widely known as an exponent of mechanistic theories of life. Some of his earliest papers—*Die Orientirung der Tiere gegen die Schwerkraft der Erde* (*tierischer Geotropismus*), 1888; *Der Heliotropismus der Tiere und seine Uebereinstimmung mit dem Heliotropismus der Pflanzen,* 1889; *Weitere Untersuchungen über den Heliotropismus der Tiere* u. s. w., 1890—were in part based on results obtained from the caterpillars of *Porthesia chrysorrhaea,* the winged plant lice of *Cineraria,* flies and maggots, establishing in his opinion, his theory of tropisms, recently restated in his book *Forced Movements, Tropisms, and Animal Conduct* (Volume One of the Monographs on Experimental Biology, Philadelphia and London, J. B. Lippincott Co.), 1918. He laid especial emphasis on quantitative experiments in biology and held that these methods lead to the theories which he advocated and oppose those of "trial and error" or of "physiological states." He sought also to extend the tropistic explanation to the instincts of insects, including the complicated actions of an *Ammophila* in provisioning her nest. In the Introduction to the last quoted volume, he wrote:

> Motions caused by light or other agencies appear to the layman as expressions of will and purpose on the part of the animal, whereas in reality the animal is forced to go where carried by its legs. For the conduct of animals consists of forced movements. . . . . . .
>
> The idea that morphological and physiological symmetry conditions in an animal are the key to the understanding of animal conduct demanded that the same principle should explain the conduct of plants, since plants also possess a symmetrical structure. The writer was able to show that sessile animals behave toward light exactly as do sessile plants; and motile animals like motile plants. The forced orientations of plants

by outside sources of energy had been called tropisms; and the theory of animal conduct based on the symmetrical structure of their body was, therefore, designated as the *tropism theory of animal conduct.*

Prof. Loeb was born in Germany, April 7, 1859, received the M.D. at Strassburg in 1884 and, after assisting in Physiology at the Universities of Würzburg and Strassburg and the Biological Station at Naples, came to Bryn Mawr College as Associate in Biology in 1891. He was successively Assistant Professor, Associate Professor and Professor of Physiology and Experimental Biology at the University of Chicago, 1892-1902; Professor of Physiology at the University of California, 1902-10, and Head of the Department of Experimental Biology, Rockefeller Institute for Medical Research, New York, from 1910 to his death. Titles of many of his publications are included in the list of Literature appended to his volume on Forced Movements.

## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### An Entomologist at Law.

An unusual case of particular interest to the grain trade was decided in the United States District Court at Baltimore recently. In August, 1922, Raymond Carr consigned from the Eastern Shore of Maryland a cargo of wheat to Baltimore grain commission merchants on board the schooner Helen. When the wheat arrived at the Western Maryland Railroad elevator it was found to be heavily infested with weevil and the elevator company refused to allow it to be unloaded into its house until it had been treated for the eradication of the insects.

Dr. John G. Beck, specialist in treating grain infested with bugs, treated the wheat with carbon bisulphide. An explosion followed the use of the chemical, causing the seams of the vessel to expand, after which it sank, resulting in the loss of both boat and cargo.

The shipper entered suit against the commission merchants and Dr. Beck. Judge Soper ruled that Dr. Beck was negligent and that he was liable to the plaintiff for the loss of the vessel. —*Public Ledger,* Philadelphia, January 31, 1924.

## The Monument to J. Henri Fabre.

A committee has been formed to continue the subscription opened in 1914 (see the NEWS for July of that year, page 321) to celebrate the centenary of the great *savant* and to erect a monument to him at Sérignan. The public subscription is under the patronage of President Millerand; Premier Poincaré and M. Leon Bérard, Minister of Public Instruction and Fine Arts, are among the honorary presidents, while the honorary committee includes M. L. Mangin, director of the National Museum of Natural History, Dr. G. V. Legros, biographer of Fabre, Prof. Bouvier and others. Subscriptions should be sent by check or postal order to M. Henry de la Paillonne, Maire de Sérignan, Vaucluse, France.

---

## A New Form of Rhynchites (Coleop.: Curculionidae).

The red rose weevils, which have been known as *Rhynchites bicolor* Fab., were shown some years ago to present several distinct races. Pierce (1913) recognised *bicolor* Fab., *cockerelli* Pierce, *ventralis* Pierce, *wickhami* Ckll., *piceus* Pierce and *viridilustrans* Pierce. Green (1920) showed that *wickhami* had additional characters to those previously recorded, and there seemed to be reason for considering it a distinct species, peculiar to the western part of the country. We now have an additional form, taken at Boulder, Colorado, on roses, which differs from all the others in being entirely red except the beak (which has the base red, or may be practically all black), the knees, and the ends of the tibiae and of the tarsal joints; or the sides of mesothorax and base of abdomen may be blackened. The sculpture of the elytra is practically as in *wickhami*, but the thorax resembles that of *bicolor* in form, instead of being strongly convex at the sides as in *wickhami*. In *wickhami* the front is nearly bare of pubescence, in *bicolor* and the new form the front is conspicuously pubescent. Two specimens of the new form were taken, one several years ago (Cockerell), the other July 8, 1923 (Harris.) The new form may be designated *Rhynchites bicolor erythrosoma*. — T. D. A. COCKERELL and R. C. HARRIS, Boulder, Colorado.

---

## Cleanup Week in Pennsylvania.

Cleanup Week will be observed throughout the state during the week beginning April 14, 1924. Appeals are being sent to the officials of every city, borough, community and hamlet in the state by the officials of the state departments of health, forest and waters and state police to prepare for the most intensive cleanup period that Pennsylvania has ever witnessed.

The cleanup efforts this year will not be confined to the settled portions of the state. In the more remote vicinities, forest wardens, state police and health officers will direct the crusade to eliminate dirt, fire hazards and conditions that menace the public health. Especial attention will be devoted to breeding spots for flies. The avowed aims of the state wide drive are announced as health protection, fire protection and forest protection. A later date is not advisable, it is explained, because the intent of the drive is to eliminate the fly breeding spots before the first spring flies deposit their eggs.

A program providing for a certain type of cleanup work on each day of the week has been formulated by the state officials in charge of the drive. Wednesday is fly and mosquito day. Cesspools, stables, pig pens, chicken coops, stagnant pools and garbage cans are to receive the attention of the citizen cleanup army on that day.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**1**—Proceedings of the Academy of Natural Sciences of Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **19**—Bulletin of the Brooklyn Entomological Society. **28**—Entomologisk Tidskrift, Uppsala. **50**—Proceedings of the United States National Museum. **52**—Zoologischer Anzeiger, Leipzig. **54**—Proceedings of the Biological Society of Washington, D. C. **57**—Biologisches

Zentralblatt, Leipzig. **59**—Journal of Agricultural Research, Washington, D. C. **68**—Science, Garrison on the Hudson, N. Y. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **76**—Nature, London. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **94**—The American Journal of Science, New Haven, Conn. **96**—Physis. Revista de la Sociedad Argentina de Ciencias Naturales, Buenos Aires. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **108**—Journal of Genetics, Cambridge, England. **114**—Entomologische Rundschau, Stuttgart. **115**—Societas Entomologica, Stuttgart. **118**—Die Naturwissenschaften, Berlin. **141**—Internationale Entomologische Zeitschrift, Guben, Germany. **144**—Proceedings of the Pacific Coast Entomological Society, San Francisco. **155**—Stanford University Publications. Biological Sciences.

**GENERAL. Blaisdell, F. E.**—[as secretary editing the minutes of the meetings: many notes on insects of the Pacific States]. **144**, ii, 15-32. **Bryk, F.**—Bibliographia Chr. Aurivilliana **28**, 44, 3-56 [1871-1922, 216 titles]. **Cook, W. C.**—The distribution of the pale western cutworm: a study in physical ecology, (Ecology, Brooklyn, New York, v, 60-69). **Dunbar, C. O.**—Kansas permian insects. Pt. 1. The geologic occurrence and the environment of the insects. **94**. vii, 171-209. **Durck, H.**—Sammel und Tötungezylinder aus Celluloid. **114**, xli, Nr. 1, 3-4. **Franck, G.**—Obituary note. **19**, xix, 1-3. **Graham, S. A.**—Forest entomological problems in the Lake States, (Journal of Forestry, Washington, xxii, 24-28.) **Haldane, J. B. S.**—A mathematical theory of natural and artificial selection. (Trans. Cambr. Phil. Soc., xxiii, 19-41.) **Howard, L. O.**—Address of the retiring president. On entomological societies. Insect parasites of insects. **10**, xxvi, 25-46. **Howes, P. G.**—Fungus diseases that destroy insects. (Nature Magazine, Washington, iii, 151-2, 158.) **International Commission** on Zoological Nomenclature Opinions rendered 78-81 (Smithsonian Miscellaneous Collections, Washington, D. C., lxxii, No. 2.) **Johannsen, O. A.**—External insect anatomy. By A. D. MacGillivray. **68**, lix, 214-5. **Porter, C. E.**—Breve reseña acerca de la contribucion de los zoologos italianos al conocimento de la fauna de Chile (Actas, Societe Scientifique du Chili, xxxi, 136-143.) **Schroder, C.**—Handbuch der entomologie. Lief. 11-12 (Bd. iii, p. 657-848). **Seitz, A.**—Verkehr und entomologie. **114**, xli; 5-6 (Cont.) **Strand, E.**—Bitte um einsendung von auto-

biographien. **52**, lviii, 56-7. **Swinhoe, C.**—Obituary. **8**, 1924, 19-20. **Townsend, C. H. T.**—An analysis of insect environment and responses. (Ecology, Brooklyn, New York, v, 14-25.) **Tragardh, I.**—Mal och medel inom skogs-entomologien, Ziele und Wege in der Forstentomologie [Resumée in German]. (Meddelanden fran Statens Skogsforsoksanstalt, Stockholm, xx, 209-240, 1923.)

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC.** **Blunck & Speyer.**—Kopftransplantation bei Insekten 1. Beilage zum Jahrebericht für 1924 des Naturwissenschaftl. Vereins in Naumburg a. S., 4 pp. **Eidmann, H.**—Das sogenennte "Praemaxillare" der insekten. **52**, lviii, 43-52. **Gauthier, H.**—Sur la presence d'Ochtebius (Hydrophilidae) dans les salines du Chott el Djerid, en Tunisie. Bulletin, Sociéte d'Histoire Naturelle de l'Afrique du Nord, Algers, xiv, 346-7. **Glaser, R. W.**—The relation of microörganisms to the development and longevity of flies. (Amer. Journ. Trop. Med. IV, 85-107.) **Legendre, J.**—Des variations dans le tropisme des Culicides. **69**, T. 128, 423-425. **de Luna.**—Sur la participation d'une peroxydase à l'apparition du pigment chez la Drosophila melanogaster Loew, **69**, T. 178, 525-527. **Muttkowski, R. A.**—Studies on the blood of insects. The structural elements of the blood. **19**, xix, 4-19.

**ARACHNIDA AND MYRIOPODA.** **Hanstrom, B.**—Ueber die histologie und vergleichende anatomie der sehganglien und globuli der araneen. (Kungl. Svenska Vet.-Akad. Handl., lxi, N. 12, 39 pp.) **Kastner, A.**—Die vergleichend anatomische bedeutung der interpulmonarfalte der araneen. **52**, lviii, 97-102.

**Carbonell, J. J.**—Algunos Datos sobre las arañas del genera Latrodectus. Una nueva especie de scorpion. **96**, vi, 350-353; 358. ***Chamberlin, R. V.**—Descriptions of new American and Chinese spiders, with notes on other Chinese species. **50**, lxiii, art. 13.

**THE SMALLER ORDERS OF INSECTA.** **Alverdes, F.**—Beobachtungen an Ephemeriden- und Libellenlarven. **57**, xliii, 577-605. **Baldus, K.**—Untersuchungen über Bau und Funktion des Gehirnes der Larve und Imago von Libellen. **104**, cxxi, 557-620. **Dietz & Snyder, T. E.**—Biological notes on the termites of the Canal Zone and adjoining parts of the Republic of Panama. **59**, xxvi, 279-302. **Howe, R. H., Jr.**—Williamsonia lintneri (Hagen), its history and distribution.

5, xxx, 222-225. ***McDunnough, J.**—New Ephemeridae from Illinois. **4,** lvi, 7-9. **Shafer, G. D.**—The growth of dragonfly nymphs at the moult and between moults. **155**, iii, 307-37. **Snyder, T. E.**—Note on mating flight of Hexagenia bilineata (Plectoptera) **10,** xxvi, 24.

***Clemens, W. A., & Leonard, A. K.**—On two species of mayflies of the genus Heptagenia. **4,** lvi, 17-18. **Snyder, T. E.**—A new subg. of Nasutitermes (Isoptera). **10,** xxvi, 20-4. An extraordinary new Rhinotermes from Panama. **54,** xxxvii, 83-6. **Tillyard, R. J.**—Kansas permian insects. Decription of a new Paleodictyopterid. **94,** vii, 203-8.

**ORTHOPTERA. Heikertinger, F.**—Was leistet das kontinuitatsprinzip in der nomenklatur. Der fall Locusta-Phasgonura-Tettigonia als nomenklatorisches schulbeispiel. **52,** lviii, 115-34.

**MacCurdy, H. M.**—Orthoptera from Gratiot County, Michigan. (Papers of the Michigan Academy of Science, Arts and Letters, ii, 215-220.) **Uvarov, B. P.**—Revised lists of species of the genera Arcyptera, Mecostethus and Ramburiella (Acrididae). **11,** (9) xiii, 242-248.

**HEMIPTERA.—Anon.**—[Review of] A Biology of the British Hemiptera Heteroptera by E. A. Butler, London, H. F., & G. Witherby, 1923, 63 shillings. **76,** cxiii, 156. **Dunn, L. H.**—Life history of the tropical bedbug, Cimex rotundatus, in Panama. (Amer. Journ. Trop. Med. iv, 77-83.) **Lacroix, D. S.**—Notes on the Cape Cod brood of periodical cicada during 1923. **5,** xxx, 203-206. **Parshley, H. M.**—A controversial note on some species of Lygaeus (Lygaeidae). **4,** lvi, 18-19. **Readio, P. A.**—Notes on the life history of a beneficial reduviid, Sinea diadema. **12,** xvii, 80-6. **Runner & Bliss.**—The three-banded grape leafhopper and other leafhoppers injuring grapes. **59,** xxvi, 419-24. **Takahashi, R.**—On the nymphs of the Aphidinae. **10,** xxvi, 1-11. **Van Duzee, E. P.**—A new Ceratocombid from Mexico. **144,** ii, 33-34. **Van Duzee & Burke.**—Trackykele. **144,** ii, 21-24.

***Annand, P. N.**—A new Chermes from pine (Aphidae). **4,** lvi, 5-6. **Blanchard, E. E.**—Aphid notes pt. III. Argentine species of the subtribes Pentalonina and Aphidina. **96,** vi, 43-58. **Chamberlin, J. C.**—Classification and geographical distribution of the Tachardiinae of the Coccidae. **144,** ii, 27-28. **Ewing, H. E.**—Our only common North American chigger, its distribution and nomenclature. **59,** xxvi,

401-3. **Lizer, C.**—Tres coccidos nuevos para la fauna argentina. **96,** vi, 99-100. **Lizer, C.**—Notas sobre tres especies del genero Dactylopius (Coccidae) halladas en el pais. **96,** vi, 106-111. **Muir, F.**—Notes on some genera of Derbidae. **10,** xxvi, 15-9. **Pennington, M. S.**—Hemipteros nuevos para la republica Argentina. **96,** vi, 315-319.

**LEPIDOPTERA. Baylis, H. A.**—Colour-production in Lepidoptera, (cont.). **9,** lvii, 29-34. **Blanchard, E. E.**—Apuntes sobre Zophodia analamprella Dyar y otros Lepidopteros que viven sobre Cactaceas en la Argentina. **96,** vi, 119-123. **Corti, A.**—Studien über die Gattung Agrotis O. I. Ueber Kataplexie bei Agrotisarten. **115,** xxxix, Nr. 2, 1-2. **Cottle, J. E.**—[Catocala at Anderson's Springs, Lake County, Calif.]. **144,** ii, 16. **Flessa, L.**—Ist die Einbürgerung von Philosamia cynthia in Deutschland möglich? **141,** xvii, 147. **Gibson, A.**—The occurrence of the tortricid, Cacoecia rosana in Canada. **12,** xvii, 51-4. **Gillott, A. G. M.**—Peregrinatory flights of Lepi. in Costa Rica. **9,** lvii, 45-6. **Glick, P. A.**—The cottonwood leaf miner (Proleucoptera albella Cham.) The survey of Myelois venipars Dyar in Arizona. (14th Ann. Rept. Arizona Comm. Agric. & Hortic., Phoenix, Ariz., 1923, 68-73, 78-97.) **Harrison, J. W. H.**—The inheritance of wing color and pattern in the Lepidopterous genus Tephrosia (Ectropis) with an account of the origin of a new allelomorph. **108,** 13, 333-352. **Hering, M.**—Anatomischer befund eines witters von Argynnis paphia. **52,** lviii, 74-81. **Kieper, A.**—Interessantes von Pyrameis cardui L. **141,** xvii, 145-6. **Musgrave, A.**—Some caterpillars injurious to man. (Australian Mus. Mag., ii, 34-6.)

**Barnes & Benjamin.**—On the synonymy of the monarch butterfly (Danaidae). **4,** lvi, 16. ***Barnes & Benjamin.**—A new Oiketicus from Texas. (Psychidae). **19,** xix, 24-5. **v.Dalla Torre, K. W.**—Lepidopterorum catalogus. Pars. 29. Cossidae. **Kruger, E.**—Beitrage zur kenntnis der columbischen Satyriden. **114,** xli, 7. (Cont.)

**DIPTERA. Bruch, C.**—Observaciones biologicas acerca de Salpingogaster nigriventris Bigot (sirfido). **96,** vii, 1-6. **Bodenheimer, F.**—Beiträge zur Kenntniss der Kohlschnake (Tipula oleracea L.) Zur Anatomie und Oekologie der Imago. **104,** cxxi, 393-441. **Cockerell, T. D. A.**—Earthworms and the cluster fly. **76,** cxiii: 193-4. **Cole, F. R.**—[Diptera at Sunol, on San Antonio Creek, Calif.]. **144,** ii, 29-30.

**Copello, A.**—Biologia de Mallophora ruficauda (Wied.) **96,** vi, 30-42. **Grassi, B.**—Razze biologiche differenti di Culex pipiens. (Rendiconti, Reale Accademia Nazionale dei Lincei, Rome, Classe di Scienze fis., mat. e nat., xxxii, 457-464.) **Jones & Bradley.**—Further observations on Tabanidae in Louisiana. **12,** xvii, 45-50. **Keilin, D.**—On the nephrocytes in the larvae and pupae of Lonchaea chorea F. (Acalypterae). **11** (9) xiii, 219-223. **Leiby & Hill.**—The twinning and monembryonic development of Platygaster hiemalis, a parasite of the Hessian fly. **59,** xxv, 337-349. **Mercier, L.**—L'atrophie des muscles du vol après la chute des ailes chez Lipoptena cervi L. (Dip. pupipare). **69,** clxxviii, 591-4. **Nitzulescu, V.**—Sur l'ingestion du bleu de methylene par Stomoxys calcitrans. **77,** xc, 155-6. **Tragardh, I.**—Skogsentomologiska Bidrag II [Chilosia] [Summary in English]. (Meddelanden från Statens Skogsförsöksanstalt, Stockholm, xx, 401-424, 1923.

**Blanchard, E. E.**—Apuntes sobre dos dipteros argentinos. **96,** vi, 319-323. ***Cresson, E. T. Jr.**—Records of some western Diptera, with descriptions of two new species of the family Bombyliidae. **1,** lxxv, 365-367. ***Curran, C. H.**—The generic position of Beris viridis Say (Stratiomyidae). **4,** lvi, 24. ***Hine, J. S.**—The North American sp. of the gen. Meromacrus, with one new sp. (Syrphidae). **19,** xix, 20-3. ***Malloch & McAtee.**—Flies of the family Drosophilidae of the District of Columbia region. . . **54,** xxxvii, 25-42. ***Melander, A. L.**—Studies in Asilidae. **5,** xxx, 207-219. ***Spuler, A.**—North American genera and subgenera of Dipterous family Borboridae. **1,** lxxxv, 369-378.

**COLEOPTERA. Brooks, F. E.**—Oak sapling borer, Goes tessellatus Haldeman. **59,** xxvi, 313-317. **Bruch, C.**—Coleopteros fertilizadores de Prosopanche burmeisteri De Bary. La forma femenina de Castanochilus bruchianus Ohs. **96,** vii, 82-88; 115-119. **Chittenden, F. H.**—Distribution of Epilachna corrupta. **19,** xix, 3. **Dallas, E. D.**—Sobre dos anomalias en coleopteros remitidos por el señor Tremoteras, de Montevideo. **96,** vi, 356-357. **Frers, A. G.**—Metamorfosis, biologia y variaciones de una especia de Crisomelido, Lema dorsalis (Oliv.) **96,** vi, 1-21. **Frers, A. G.**—Metamorfosis de coleopteros argentinos. Algunas monstrosidades en coleopteros. **96,** vi, 254-262; 347. **Frost, C. A.**—Agrilus viridis in Massachusetts. **19,** xix, 27. **De Garnett.**—[Coleoptera on San Antonio Creek near Sunol, Calif.]. **144,** ii, 19. **Lizer, C.**—Dos palabras acerca de una variedad

del Coccidophilus citricola Bthes. **96,** vii, 54-55. **Snyder, A. F.**—Importance of the White Pine Weevil. (Forest Leaves, Philadelphia, Pa., xix, 109-110.) **Spessivtseff, P.**—Bidrag till kannedomen om bruna oronvivelns (Otiorrhynchus ovatus L.) morfologi och biologi. [Resumée in German.] Meddelanden fran Statens. Skogsförsöksanstalt, Stockholm, xx, 241-260. 1923). **Tragardh, I.**—[Pissodes, Orchestes, (see Diptera)]. **Van Dyke, E. C.**—[Coleoptera of Oregon and California]. **144,** ii, 16-19. **Wallace, G.**—[Coleoptera in the vicinity of Lake Tahoe, California]. **144,** ii, 15-16, 19.

**Bernhauer, M.**—Coleopterologische Beiträge. [Nn. spp. Oligota from the Antilles.] **28,** 44, 141-6. ***Blaisdell, F. E.**—Two new species of Melyridae from California and one from British Columbia, including two new genera. **4,** lvi, 1-5. ***Dawson, R. W., & McColloch, J. W.**—New species of Bolbocerosoma (Scarabaeidae). **4,** lvi, 9-15. **Dury, C.**—Note on Anamorphus. **19,** xix, 25. ***Fisher, W. S.**—A new sp. of Brachys from Arizona. (Buprestidae). **10** xxvi, 12-3. **Pic, M.**—Melanges exotico-entomologiques. Fasc. 39-40.

HYMENOPTERA. **Baumann, C.**—Ueber den bau des abdomens und die funktion des lege-apparates von Thalessa leucographa. **52,** lviii, 149-62. **Bruch, C.**—La reina de una hormiga legionaria Eciton dulcius For. var, jujuyensis Forel; costumbres de las obreras y mirmecofilos de las mismas hormigas. Costumbres y nidos de hormigas. **96,** vi, 105; 118. **Frühauf, E.**—Legeapparat und Eiablage bei Gallwespen (Cynipiden). **104,** cxxi, 656-723. **Kuhn, A.**—Zum nachweis des farbenunterscheidungsvermogens der bienen. **118,** vi, 116-8. **Johnson, C. W.**—Notes on the nests of Odynerus (Ancistrocerus) birenimaculatus Saussure. **5,** xxx, 226-7. **Plath, O. E.**—Notes on the egg-eating habit of bumble bees. **5,** xxx, 193-202. **Rau, P.**—A note on the nesting habits of Tachytes distinctus Sm. **5,** xxx, 220. **Toedtmann, W.**—Die spermtozoen von Formica rufa. **52,** lviii, 52-5. **Tragardh, I.**—[Lyda, Trichogramma (see Diptera)].

***Malloch, J. R.**—A new sp. of the gen. Brachycistus (Aculeata). **19,** xix, 23. **Schmiedeknecht, O.**—Opuscula ichneumonologica. Fasc. 38. (p. 2963-3042). ***Viereck, H. L.**—Descriptions of two Canadian bees of the genus Melecta; *Prodromus of Andrena, a genus of bees. **4,** lvi, 15; 19-24. ***Viereck, H. L.**—The identity of Conohaltictoides novaeangliae. **10,** xxvi, 14-5. **Wheeler, W. M.**—Ants of the genera Myopias and Acanthoponera. **5,** xxx, 175-192.

## SPECIAL NOTICES

**Bibliographia Zoologica.**—Vol. 33 of this work has just been received. Pages 393-473 include the Insecta. For the most part the references are for the years 1917 to 1921, but several titles appearing before and after these dates are cited.

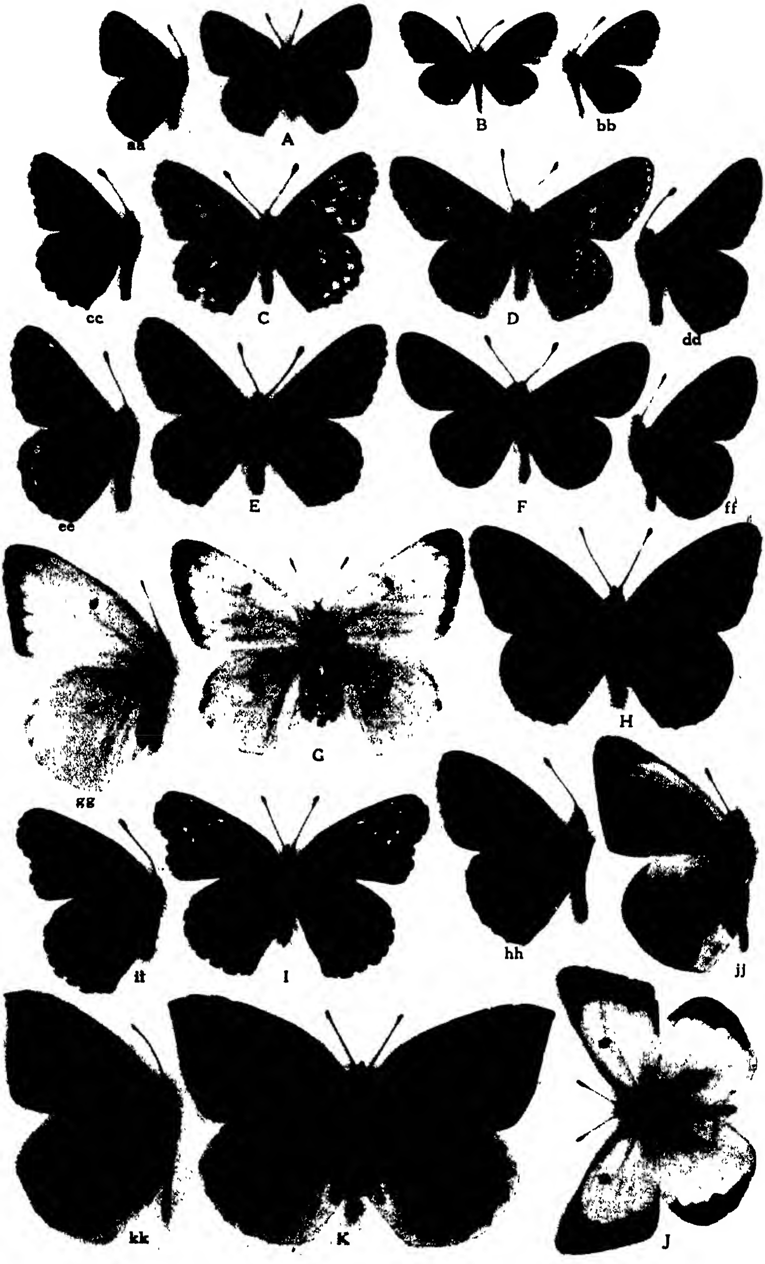
**Macrolepidoptera of the World.**—Parts 314-317 have just appeared (English edition). Part 314 contains Fauna americana Pt. 132, Genera Paeudalpia to Psychomorpha. By M. Draupt. The other parts contain Fauna indoaustralica.

**Opuscula Ichneumonologica.**—Herausg. von O. Schmiedeknecht. Fascicle 38 of this long interrupted work. The last previous part was issued in 1914. This part includes pages 2963 to 3042.

## OBITUARY.

The death of Colonel CHARLES SWINHOE on December 2, 1923, at Avonmore, West Kensington, London, is announced in the English journals. He was born August 29, 1836, and served in the Indian Army for more than thirty years, accompanying Lord Roberts on the march to Kandahar. Becoming interested in the birds and Lepidoptera of India, he published a number of volumes on the latter, among them *Catalogue of the Moths of India* (in collaboration with E. C. Cotes, Calcutta, 1887-9), the completion of *Lepidoptera Indica* (after the death of Dr. Frederic Moore), *Catalogue of Eastern and Australian Lepidoptera-Heterocera of the Oxford University Museum* (2 vols., 1892, 1900) and *A Revision of the Genera of the Family Liparidae* (Ann. & Mag. Nat. Hist., 1923 and earlier years). For more than the last thirty years he lived in Oxford and in London. Ent. Mo. Mag., Jan., 1924; Nature, Jan. 5, 1924).

The Rev. Canon THEODORE WOOD died at Wondsworth Common, England, December 13, 1923. He was the son of the Rev. J. G. Wood, author of numerous, well known, popular books on natural history, was born August 6, 1862, and himself the writer of *Our Insect Allies, Our Insect Enemies* and of notes on British Coleoptera. (Ent. Mo. Mag., Jan., 1924;) Nature, Jan. 5, 1924).


aa
A
B
bb
cc
C
D
dd
ee
E
F
ff
gg
G
H
ii
I
hh
jj
kk
K
J

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV    MAY, 1924    No. 5

CONTENTS



# Several New Aberrant Lepidoptera (Rhopalocera) from California.

By J. D. GUNDER, Pasadena, California.

(Plate II)

European students are more than ever dividing up and separating all groups of Lepidoptera. In America, some authorities say, we are just beginning to do so. As yet, we do not go in for general specialized breeding with the idea of producing variations just to name them. There is plenty of virgin territory left without that. California alone has thousands of square miles never trodden over by an entomologist.

In Southern California aberrant forms are plentiful. Every collection contains a number. On every collecting trip, one or more of the commoner things are apt to be taken. There are perhaps three or four good local reasons. Probably the foremost is our variation of climate, some seasons being cold, some hot, some dry, some wet, with sea breezes and desert winds all in the same locality. Besides the distances are short between sea level and the different higher altitudes. All of these are disturbing and discouraging elements to insect development and undoubt-

edly work for change. Eventually, though not perhaps in our day, there will be several aberrant forms alone noted for every butterfly in the State.

The specimens shown on the plate are natural size and are fairly colored. The half-figures are typical and normal specimens placed there for quick comparison, in conjunction with the following descriptive text.

**Callipsyche behrii** Edw. (half-fig. aa), ab. ♂ **nigroinita** nov. aberr. (fig. A).

Testaceous disks on upper sides of both primaries and secondaries centered and condensed in a small oval area nearer the inner margins. The fuscous from the borders extending inward even from along the inner margins of both wings, especially on the primaries, which is unusual. The under sides are normal. Expanse: 26 mm.

*Data: Holotype* ♂ (Author's Coll.) Mammoth Camp, Mono County, California; August 5, 1921.

**Melitaea chara** Edw. (half-fig. bb), ab. ♂ **jacintoi** nov. aberr. (fig. B).

*Primaries.* Upper side: fuliginous marginal border broader, tapering off at inner angle, curved in and much wider at apex; followed by a row of seven cylindrical clay-brown spots, bending in at apex, top one near costal being small and round; upper discal area paralleling lower radial, solid fuliginous, with irregular spots toward inner side, lower discal area with a prolongation of spotting from the outer series following interspaces; transverse semi-lunate bar on base line between the costal and inner margin; basal angle flashed with same color.

Under side: clay color predominant; pattern as on upper side; fuliginous only in outline; outer edges of cylindrical spots tinged with white.

*Secondaries.* Upper side: outer border as in primaries; row of spots less elongated and not reaching costal; single, conspicuous, dark, round spot in center of cell; semblance of three spots close to basal angle.

Under side: strongly similar to normal, except in basal area where the single spot is again conspicuous. Expanse: 24 mm.

*Data: Holotype* ♂, (Author's Coll.) Palm Springs, Riverside County, California; May 28, 1922. Named after Mt. San Jacinto on whose desert slope it was taken, flying with typical specimens.

**Euphdryas gabbii** Behr. (half-fig. cc), ab. ♂ **pasadenae** nov. aberr. (fig. C).

The brownish shades of both upper and under sides entirely replaced by luteo-testaceous, which also grades in shading in a corresponding way as in the typical. Design of marking unchanged. Condition and peculiarity of changed color very similar to ab. *foxi* of *Euphdryas rubicunda*. Expanse: 34 mm.

*Data: Holotype* ♂, (Author's Coll.) Pasadena, Los Angeles County, California; May 20, 1921.

**Euphdryas rubicunda** Hy. Edw. (half-fig. dd), ab. ♂ **foxi** nov. aberr. (fig. D).

The brick-red of both upper and under sides entirely replaced by luteo-testaceous; the original luteous remaining as in normal specimens, and only slightly contrasting. Design of marking unchanged. Peculiarity of changed color somewhat similar to that of ab. ♂ *pasadenae* of *Euphdryas gabbii*. Expanse: 39 mm.

*Data: Holotype* ♂, (Author's Coll.) Gold Lake, Sierra County, California; July 17, 1921.

*Paratype* ♂, (Deposited in Coll. of Southwest Museum, Los Angeles, California.) July 13, 1921; Gold Lake, Sierra County, California. Named for Mr. Chas. L. Fox, San Francisco, Calif.

*Note:* Normal typical specimens from this region have the outer half of the secondaries solid bright red, which is only cut by the black of the nervules. They are quite different from the *nubigena* group and the uncertain *quino* separation.

**Euphdryas editha** Bdv. (half-fig. ee), ab ♂ **fieldi** nov. aberr. (fig. E).

*Primaries.* Upper side: row of red spots on outer margin normal; followed by two broad bands of elongated, semi-sinuous, pale ochraceous spots, confluent at 3rd. median nervule and contoured in at apex and occasionally having red tinge; beyond, black, through remaining half of discal and basal areas, with two small reniform red spots following and at right angles to median vein.

Under side: red predominant; red spots at outer margin become solid band; elongated pale ochraceous spots become small and partly crescentic in shape; black area of base mottled with red, fusing with the two reniform spots.

*Secondaries.* Upper side, right wing: outer half nearly normal; black outlines heavier; basal area solid black.

Under side, right wing: same condition, except redder.

Upper side, left wing: more aberrant, being only in black and red, having outer row of compressed red spots, followed at some distance by a parallel series slightly larger; a third row of three odd-sized and -shaped spots start just anterior to the basal area at the costa, but extend only half across the wing.

Under side, left wing: design similar; traces of white on outer edge of second row of red spots; partial row of diffused white spots between 2nd and 3rd rows; black and red conglomerate at base. Expanse: 38 mm.

*Data: Holotype* ♂, (Author's Coll.) San Diego, San Diego County, California; April 26, 1920. Named for Mr. Geo. Field, San Diego, Calif.

*Note:* Normal typical specimens, with which this aberration was found, are identical with Boisduval's illustration, though perhaps his appears clearer cut. It is remembered that *quino* (termed from this general territory) should be nearer the *chalcedona* group, especially in shape. Questioned.

**Brenthis epithore** Bdv. (half-fig. ff), ab. ♂ **wawonae** nov. aberr. (fig. F).

Markings of basal area of both wings up to mesial line more conflect and confused, with that of secondaries practically black immaculate. Row of round spots on primaries obsolete and lacking on secondaries, except for mere dots nearer inner angle. Lines and lunules of hind margin thicker and confused into a border banding. The under sides show the same consistent change in characteristics. Expanse: 38 mm.

*Data: Holotype* ♂ (Author's Coll.), Wawona, Mariposa County, California; July 6, 1922.

**Eurymus hartfordii** Hy. Edw. (half-fig. gg), ab. ♀ **weaverae** nov. aberr. (fig. G).

*Primaries:* Upper side: brighter yellow; normal, except for a powdered, salmon-rose patch or flush in the discal and subbasal areas between the spot and inner margin, being more dense along the nervules and submedian vein and slightly shading out at inter-space openings.

Under side: this salmon-rose color has seemingly percolated through over the same described area.

*Secondaries.* Upper side: the whole wing seems dusted over with this color, the shade being more tense on the inner half; discal spot one-third larger and very bright in color.

Under side: normal, with no trace of the added color. Expanse: 44 mm.

*Data: Allotype* ♀, (Author's Coll.) Warner Springs, San Diego County, California, July 3, 1919.

Taken in company with other *E. hartfordii.* As some specimens lack color, so this one, through some freak of Nature, has an over-abundance of it. Because sometimes our West Coast *E. hartfordii* have a red or orange tinge on or near the discal spot, I do not quite consider this specimen a hybrid, though it is possible. Named in memory of Nettie E. Weaver, of Fairmount, Illinois.

**Argynnis montivaga** Behr. (half-fig. hh), ab. ♂ **mammothi** nov. aberr. (fig. H).

*Upper side:* the two parallel lines at outer margin fused together making a nearly solid black border edging, which is cut by nervules only on the primaries; crescents are flattened and smaller, especially on the secondaries; sub-marginal row of round black spots nearly obsolete on primaries, being mere dots, except in the interspace openings of the median nervules, where they are no larger than the smallest on typical specimens; they are entirely absent on the secondaries; irregular markings of basal half of both wings heavier and conglomerate.

*Under side:* corresponding change of characteristics. Expanse: 44 mm.

*Data: Holotype* ♂, (Coll. of J. Riddell, F.E.S., Hollywood, Calif.) Mammoth Camp, Mono County, California; July 31, 1921.

*Paratype* ♂, (Author's Coll.) Mammoth Camp, Mono County, California; July 28, 1921.

**Chlosyne californica** Wright (half-fig. ii), ab. ♀ **chinoi** nov. aberr. (fig. I).

*Primaries:* Upper side: ochraceous predominant from outer margin to sub-marginal black band which is obsolete and wholly so at median nervules; black of basal half, partly erased in appearance, especially in discal space; veining less marked.

*Secondaries:* Upper side: black sub-marginal band practically erased, and wholly so from costal margin to lower radial; basal area as in primaries with outer edge suffused and blending; veining much less marked also.

*Under sides:* less black marking with same changed condition. Expanse: 41 mm.

*Data: Allotype* ♀, (Author's Coll.) Palm Springs (Chino Canyon), Riverside County, California; October 18, 1921.

W. G. Wright in his original description says, "This new species is very different from any known *Synchloe,* and is a departure from the Arizona tangle of the species of the intergrading, *Crocale* type, *for it is quite true and constant, not differing essentially at any point;* these examples here figured are the extreme forms illustrated to show outside variations." Therefore, the author considers this an unusual specimen, being one of hundreds taken up Chino Canyon in the fall brood of 1921, a rainy season, and the only one with aberrant tendency.

**Eurymus eurytheme** Bdv., form **amphidusa** Bdv. (half-fig. jj), ab. ♂ **unicitrina** nov. aberr. (fig. J).

Entirely lacking the orange color and rose tinting of fringes, antennae and body parts which is replaced by that lemon-yellow found near the costal veins of normal specimens. There is no trace of contrasting color in or near the discal spot of the secondaries, which makes this specimen quite unique. The replacement by lemon-yellow is complete. Expanse: 41 mm.

*Data: Holotype* ♂, (Author's Coll.) Upland, Los Angeles County, California; August 2, 1921.

This specimen was taken in company with numerous examples of the typical form *amphidusa.*

*Note:* Form *eriphyle* occurs only in the extrême northeastern sections of California. These specimens show a distinct color at the discal spot and have slightly rose-tinted fringes.

**Zerene eurydice** Bdv. (half-fig. kk), ab. ♂ **fanniae** nov. aberr. (fig. K).

Different from the typical form only on the upper side of the primaries. Here the anthracinus of the limbal area in front of the "dog's head" extends up around through the discal and basal areas between the median vein and costal margin, translucently covering the "forehead and eye" with that dark blue opaline reflection peculiar to this species. The outline of the "nose and throat" is somewhat suffused. Expanse: 58 mm.

*Data: Holotype* ♂, (Author's Coll.) San Bernardino Mts., San Bernardino County, California; July 6, 1922.

Aberrations are quite rare, though hundreds of these butterflies are used for commercial purposes. Named for Mrs. J. D. (Fannie) Gunder.

# Descriptions of New Genera and Species of the Dipterous Family Ephydridae. Paper VI.*

By E. T. Cresson, Jr.

**Rhysophora robusta,** new genus, new species.

Large robust, black species with white halteres; wings immaculate, brownish tinged, with black veins. Subopaque species with brown dusting. Frons except the large ocellar triangle and narrow orbits, opaque; the reclinate frontal bristles far in advance of the ocellars. Face with well developed foveae; four or more bristles each side; lower part wrinkled; epistoma retreating. Supra-alar bristle very strong, much longer than the notopleurals. Length: 4.5 mm.

*Type:* ♂ ; Dyke, Virginia, July 16, 1915 (W. L. McAtee; on flowers of *Pontederia cordata*), [U. S. National Museum Collection]. *Paratypes*—2 ♀, topotypical.

I have seen other specimens from Massachusetts and New York. The wrinkled, retreating face, as well as the large size, will distinguish this species from those of *Discocerina.*

**Ditrichophora,** new genus.

This genus is proposed for those Discocerine species having only two facial bristles in the primary series. The lower portion of the face is shorter than in typical *Discocerina.* The parafacialia are generally narrow, very slightly dilated below; eyes bare; no supra-alar bristle. Most species are shining and in many respects resemble those of the Psilopini.

*Genotype.—Ditrichophora exigua* n. sp.

The following known species also belong here: *Discocerina xanthocera,* Lw., *Discocerina nana,* Will., and *Discocerina aliena,* Cress.

**Ditrichophora exigua,** new species.

Black; third antennal segment below, proboscis, fore coxae, bases and apices of tibiae, and tarsi except apices, pale yellowish. Halteres white. Wings hyaline with pale veins. Opaque to subopaque species. Frons opaque black, with large ocellar triangle and narrow orbits more grayish; face black, obscure shining in places; cheeks more grayish. Mesonotum and scutellum brownish to grayish at margins; pleura and metanotum

* For Paper V, see Ent. News, xxxiii, 135-137, 1922.

grayish and more shining. Abdomen subopaque, black with brownish tinge.

Frons as long as or longer than broad; lower part of face prominent at upper bristle, then strongly receding to epistoma; no secondary series of bristles. Length: 1.5 mm.

*Type:* ♂ ; Swarthmore, Pennsylvania, July, 1908 (Cresson), [Acad. Nat. Sci. Phila. Collection, No. 6292]. *Paratypes*—7 ♂ , 3 ♀ ; topotypical.

This species is apparently common in the Eastern United States.

**Ditrichophora tacoma,** new species.

A shining, sparingly brown to yellowish pruinose species, with antennae yellow in the male, less so in the female. Halteres white. Face densely golden yellow in the male, more whitish in the female; cheeks gray. Wings hyaline, with dark veins. Face scarcely longer than broad; foveae not very marked.

*Type:* ♂ ; Tacoma, Washington, August 27, 1911 (A. L. Melander) [University of Washington Collection]. *Paratypes*—2 ♀ ; topotypical.

A female from Fort Kent, Maine, August (C. W. Johnson) [Boston Soc. Nat. Hist.], appears to be conspecific.

**Ditrichophora parilis,** new species.

Very similar to the western *aliena*, but less polished, with the thorax overcast with gray. Head as broad as high; fronto-facial profile convex, not flattened and vertical as in *aliena*; face scarcely longer than broad.

*Type:* ♂ ; Bar Harbor, Maine, August 18 (C. W. Johnson) [Boston Society of Natural History Collection].

A female from Mt. Ascutney, Vermont, July 11 (Johnson; 3,000 feet altitude) [Boston], may or may not belong here, but it does not represent any other described species.

**Ditrichophora xanthocera** (Loew).

1869. *Hecamede xanthocera* Loew, Ber. Naturh. Ver. Augsburg, xx, 58.

1862. *Discocerina lacteipennis* Loew, Mon, Dipt. N. Am., i, 145.

The examination of Loew's types of *lacteipennis* reveals this synonymy. The species is very easily distinguished by the

general whitish appearance of the body and wings. The yellow antennae and the conspicuous, upcurved, lower facial bristle of the secondary series, are among the salient characters. The species is widely distributed in the United States.

**Polytrichophora,** new genus.

This genus is erected for the reception of those species of *Discocerina, sens. lat.*, having a secondary series of facial bristles laterad of, directed outwardly in opposition to, and somewhat alternating with, those of the primary series. The eyes in all known species are distinctly pubescent.

*Genotype—Polytrichophora agens* n. sp.

*Discocerina orbitalis* Lw., 1861, also belongs here.

**Polytrichophora agens,** new species.

Black; frons anteriorly, antennae entirely, palpi, knees, apices of tibiae and all tarsi, yellow. Halteres also yellow. Wings whitish with yellow veins, costa black. Opaque, light gray; frons slightly yellowish pruinose, except orbits and ocellar triangle. Abdomen slightly shining distally; femora dusted; tibiae silvery outwardly. Large robust species. Face and cheeks very broad with all bristles and setulae well developed, especially those on the parafacialia. The series examined seem to be composed of all females. I do not know the male. *Length:* 3 mm.

*Type:* ♀ ? Galveston, Texas, June, 1900 (W. M. Wheeler) [American Museum of Natural History Collection]. *Paratypes* —5 ♀ ? topotypical.

**Polytrichophora conciliata,** new species.

Very similar to the Neotropical species *Discocerina setulosa* Cress., which also belongs in this genus. The oral cavity, on account of the broad, shallow, reflexed, epistomal emargination, attains the line of the middle primary facial bristles; setulae of the parafacialia are somewhat stronger than in *setulosa*. The posterior median mesonotal series of setulae contains two to three pairs which are bristle-like, nearly as strong as the praescutellars. Fore femora stout, with an anterior flexor series or comb of closely set, fine bristles or spines; the posterior flexor series of long bristles, but no comb.

*Type:* ♂ ; Wildwood, New Jersey, July 18, 1908 (Cresson) [A. N. S. P. No. 6293].

I also have examined specimens from Maine and New York.

**Hydrellia morrisoni,** new species.

Black; tarsi brownish-yellow. Halteres pale yellow. Wings hyaline, veins pale. Opaque; abdomen rather shining; frons and mesonotum dark gray; frontalia not conspicuous; lunule gray; face white, becoming gray along orbits; occiput, pleurae and venter gray. Reclinate frontals present; anterior dorso-centrals weak if discernible.

*Type:* ♂; White Mountains, New Hampshire (Morrison) [U. S. National Museum Collection]. *Paratype:* 1 ♂; topotypical.

**Hydrellia notiphiloides,** new species.

Black; palpi and halteres yellow. Opaque; frons, except frontalia, and mesonotum subopaque. Frontalia and anterior frontal margin black; lunule and face white, the latter somewhat yellowish. Occiput, humeri, pleura, abdomen laterally, venter and femora greenish-cinereous. Mesonotum olivaceous; abdomen more whitish. Wings hyaline, veins pale. Cheeks broader than third antennal segment; face with very strong bristles; arista with six hairs. Anterior dorso-centrals well separated. Ocellar bristles nearly as strong as post-ocellars. *Length:* 2 to 2.5 mm.

*Type:* ♂; Cedar Point, Sandusky, Ohio, August 5, 1902 [Ohio State University Collection]. *Paratypes:* 1 ♂, 5 ♀; topotypical.

This species also occurs in Massachusetts.

**Philygria picta** (Fallen).

1813. *Notiphila picta* Fallen, Handl. K. Svensk. Vet. Akad., xxxiv, 254.

1844. *Philygria picta* Stenhammar, Handl. K. Svensk. Vet. Akad., 1844, 243.

I can report this species from New Jersey and Maryland. It is probable that Coquillett's determination in Mrs. Slosson's list is correct.

**Lytogaster extera,** new species.

Black and shining; base of tarsi rather brownish. Face with highly polished median tubercle; the polished area extending dorsally in form of a stripe, being in contrast with the white pruinose remainder of the face. Cheeks and occiput white pruinose. Mesonotum smooth and shining, as are also the lateral areas of abdominal dorsum; the depressed area on

dorsum of second and third segments is not as distinct as in other species of the genus. *Length:* 2 mm.

*Type:* ♂ ; Trenton, New Jersey, August 21, 1910 (H. S. Harbeck) [A. N. S. P. No. 6294].

I have also seen this species from Massachusetts and Illinois.

**Napaea alpina,** new species.

Black: base of tarsi tawny. Frons shining, bluish; vittae black and subopaque. Face white pruinose, becoming much denser at oral margin; clypeus concolorous. Mesonotum shining, sparingly brown pruinose, grayish towards pectus. Scutellum subspherically convex, broader than long, without tubercles; apical bristles separated by about one-third to one-half their length. Halteres whitish. Abdomen shining, scarcely metallic tinged, thinly white pruinose. Wings distinctly brownish towards costa and apex, with costal cell clear; cross-veins distinctly clouded in contrast with the whitish areas each side; second vein not appendiculated. *Length:* 3.5 to 4 mm.

*Type:* ♂ ; Longmire's Springs, Mount Rainier, Washington, August 2, 1905 (J. M. Aldrich) [A. N. S. P. No. 6295]. *Paratypes:* 2 ♀ ; topotypical.

A specimen from Fort Kent, Maine, August (C. W. Johnson) [Boston], shows no differences from the typical series except in its smaller size.

**Clanoneurum cimiciformis** (Haliday).

1855. *Discomyza cimiciformis* Haliday, Nat. Hist. Rev., ii, 124.

1903. *Clanoneurum cimiciformis* Becker. Mitt. Zool. Mus. Berlin, ii, 165.

Specimens of this species are before me from Maine, New York, Arizona, Utah and California. Comparison with specimens of *cimiciformis* from Europe fail to reveal any differences of specific importance.

**Trimerina madizans** (Fallen).

1813. *Notiphila madizans* Fallen, Handl. K. Svensk. Vet. Akad., xxxiv, 252.

1835. *Trimerina madizans* Macquart, Hist. Nat. Ins. Dipt., ii, 539.

On comparing specimens from Massachusetts, New Hampshire and New York before me with those from Europe, they fail to reveal any differences of specific importance.

**Canacea macateei,** Malloch.

1924. *Canacea macateei* Malloch, Proc. Ent. Soc. Wash., xxvi, 52.

This species was described from a series of both sexes from Jekyl Island, Georgia. I have specimens from several eastern states as well as one from California. It is the genotype of Malloch's? genus *Canacea,* which is not congeneric with *Canace,* but which may prove to be synonymous with *Chaetocanace* of Hendel, 1914, erected for an East Indian species.

## Notes on North American Halticinae with Descriptions of Two New Species and a New Variety (Coleoptera).

By L. G. Gentner, East Lansing, Michigan.

The following paper is published with a view to giving additional distributional records and descriptions of new species. I am indebted to Prof. H. C. Fall for verification of identifications and to Dr. Henry Skinner, Mr. E. T. Cresson, Jr., and Mr. Nathan Banks, for comparison of specimens with types.

Haltica polita Olivier.—Two males and one female of this species are in my possession from Wellfleet, Mass., Aug. 21, 1921. These specimens seem to be typical of that species except that they are somewhat smaller than the ones I have from Georgia. The species has heretofore been reported only from South Carolina and Georgia.

Epitrix brevis Schwarz.—One specimen was taken by me at East Lansing, Mich., July 26, 1922, while sweeping *Solanum.* This species has not been reported north of Indiana.

Epitrix fasciata Blatchley.—Three specimens were collected at Smith Point, Texas, September 1, 1922, on *Datura tatula* by L. J. Bottimer. Mr. Bottimer has also sent me 27 specimens collected in Jan., 1923, at Brownsville, Kingsville and San Benito, Texas. Heretofore this species has been reported only from Florida.

Epitrix parvula Fabricius.—One female was taken by me at East Lansing, Mich., July 25, 1922, on *Solanum,* making a new record for the state.

**Chaetocnema (protensa) splendida** new variety.

Very elongate oval, more than twice as long as wide, surface distinctly bronzed or brassy except elytra which are deep blue, moderately shining.

Antennæ more or less rufotestaceous at base, the outer six joints piceous. Head more or less alutaceous, moderately punctured, front and genæ densely punctured and densely covered with whitish hairs.

Thorax one-third wider at base than long, sides regularly arcuate, narrowing slightly to apex, basal marginal line distinct at the sides, surface more or less alutaceous, the punctures moderate in size, separated at least by their own diameters. Elytra slightly wider at base than thorax, humeri rounded, umbones not prominent, disc convex, the striæ regular, not impressed, composed of rather coarse and moderately closely placed punctures, the intervals flat, wider than the striæ, surface faintly alutaceous. Body beneath piceous, brassy bronze.

Prosternum closely punctate.

Abdomen moderately coarsely, but not closely punctate, variable, shining, very faintly alutaceous. Femora piceous, bronzed. Tibiæ and tarsi rufotestaceous. Length 2.5—2.9 mm.

♂.—Last ventral segment of abdomen deeply sinuate each side of middle, median lobe prominent. First joint of anterior tarsi somewhat dilated.

*Type:* male; East Lansing, Mich., in collection of Entomology Dept., Mich. Agr. Coll. Paratypes in collections of U. S. National Museum, Canadian National Museum and Entomology Dept., Univ. of Wis.

Described from a series of twenty specimens. This is the prettiest of all of the North American species of *Chætocnema*. It differs from the true *protensa* only in the deep blue color of the elytra. The tendency toward the blue coloration in the true *protensa* is seen in the bluish cast of the scutellum, of the region of the head between the base of the antenna and the eye, on the front, and sometimes on the anterior and middle femora. In the variety the scutellum is bronzed. I have one specimen in which the punctures of the scutellar striæ are somewhat confused. The punctuation of the head, thorax and abdomen is variable in density and some individuals are much more alutaceous than others. I have examined hundreds of individuals of the typical *protensa* and all are more or less distinctly alu-

taceous, which fact was not mentioned by Horn. Horn states that a specimen from Garland, Colorado, has the thorax distinctly cupreous and the elytra greenish bronze. I have taken two such specimens in Michigan, but they are quite distinct in coloration from the blue variety.

Occurs along with *protensa* on common marsh grass at the rate of about one to twenty-five at East Lansing, Mich., during the earlier part of May. One specimen was taken in September, 1923. I have seen one female from Edmonton, Alberta, Canada, collected by F. S. Carr and three males from Aweme, Manitoba, collected by N. Criddle, one of which was more of a violet blue.

CHAETOCNEMA OPULENTA Horn.—On May 21, 1920, I took one female and on May 25, one male and two females of this species at Madison, Wis., while sweeping the grass at the edge of a marshy place on the shore of Lake Mendota. This species has previously been reported from S. Calif., N. Mex. and Ind.

CHAETOCNEMA PULICARIA Melsheimer.—Oct. 16, 1922, I took one male at East Lansing, Mich., and on Sept. 17, 1923, one female by sweeping. This species has not previously been reported from this state.

**Glyptina abbreviata** new species.

Oval, moderately elongate, convex. Wings rudimentary, normally reaching half-way to apex of elytra. Body above rufotestaceous, shining, below piceous to almost black except prothorax which is the same as above.

Antennæ and legs rufotestaceous. Last segment of antennæ and hind femora sometimes slightly darker. Head shining, impunctate, with the exception of a few coarse punctures near each eye. Thorax one-half wider than long, but little narrower in front than at base, anterior angles with an oblique truncation behind which there is a distinct angulation, sides moderately arcuate, disc convex, finely and sparsely punctate, punctuation variable. Elytra more or less translucent, wider at base than thorax, regularly arcuate from base to apex, humeri indistinct, umbones very faint, disc very feebly striate, punctures coarse, well separated in rows.

Abdomen shining, distinctly punctate. Length 1.5—1.9 mm.

♂.—With the last ventral segment usually of paler color, sinuate each side, with a median lobe and a darker impressed

median line extending the entire length of the segment. First segment of anterior tarsi dilated. In the darker forms the last segment is scarcely paler and the median line is hard to distinguish.

*Type:* male; Madison, Wisconsin, in collection of Entomology Dept., Mich. Agr. Coll. Paratypes in collections of United States National Museum, Canadian National Museum and Entomology Dept., Univ. of Wis.

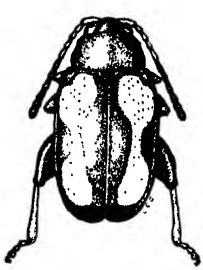
Described from a large series of specimens collected at Madison, Wisconsin, and East Lansing, Michigan. The elongate oval form, indistinct humeri, rudimentary wings and much darker under side distinguish this species from *spuria* to which it is most closely related. In Horn's key it should come first among those with yellowish or rufotestaceous elytra. The punctuation of the prothorax is quite variable ranging from fine and sparse to rather coarse and dense. The color above also varies from rufotestaceous to dark piceous. The elytra are more or less translucent permitting the rudimentary wings to show through as lighter blotches, while the dorsal abdominal segments show piceous or blackish. Possibly this species stands wrongly named as *brunnea* in some collections as I have received it under that name.

I have taken this insect in large numbers during May, feeding and mating on wild geranium, both in Wisconsin and Michigan. One specimen was sent me from Oradell, New Jersey.

GLYPTINA BRUNNEA Horn.—There seems to be a question as to what really is the true *brunnea*. Certain correspondence and the examination of specimens have led me to believe that for some reason the species which I am herein describing as *abbreviata* has been wrongly placed under the name of *brunnea* in some collections. I have examined a series of specimens from Georgia which I believed to be the true *brunnea* and comparison of examples with Horn's type proved them to be such. They agree very well with his description in that they are larger and more robust than either *abbreviata* or *spuria*, have the thorax wider in proportion and have the same color below as above. The reddish-brown color mentioned by Horn is peculiar to them.

**Phyllotreta conjuncta** new species. Text figure.

Oblong oval, moderately robust, piceous, shining, each elytron with a broad brownish-yellow vitta, very much narrowed in the middle.



*Phyllotreta conjuncta* n. sp., male type.

Antennæ about half as long as body, distinctly thicker externally, piceous, the basal five joints more or less rufotestaceous. Head sparsely, finely punctate, faintly alutaceous.

Thorax at base one-half wider than long, narrowed in front, front angles obliquely truncate, sides arcuate, disc convex, punctures moderate, not closely placed, surface faintly alutaceous. Elytra distinctly wider at base than thorax, humeri obtusely rounded, the punctures coarser than those of thorax, with a slight tendency toward strial arrangement on basal half, vitta broad, covering about three-fourths the width of elytron, anteriorly nearly reaching base and margin, but not covering umbone, at middle with a deep and sudden excavation on outer side and a long shallower one on inner side, posteriorly not reaching margin or apex.

Body beneath piceous, abdomen sparsely punctate. Legs rufotestaceous, femora darker. Length 2.0 mm.

♂.—Last ventral distinctly sinuate each side, middle lobe moderately prominent with a rather deep, triangularly oval concavity and a median impressed line extending the length of the segment. Antennæ with the fifth joint not longer or larger than the sixth.

*Type:* male; East Lansing, Michigan, in collection of Entomology Dept., Michigan Agricultural College.

Described from a single specimen taken July 12, 1921, while sweeping. This species closely resembles *bipustulata* in form and sculpture and may at some time be shown to bear closer than specific relation to it. A careful examination gives one the impression that it might possibly be an individual of that species with the two spots connected by a vitta about one-eighth of a millimeter in width. It belongs to the series in which the antennæ are not different in the sexes.

I have taken one male *bipustulata* at Waupaca, Wisconsin, in which the spots are connected by a very faint narrow line on the left elytron and by an interrupted line on the right one. I have also taken a male and a female at Madison, Wisconsin, which show traces of a connecting line.

## A New Genus of Bees from California (Hymen.).

By T. D. A. Cockerell, University of Colorado,
Boulder, Colorado.

On April 18, 1923, Mr. E. Bethel was examining some flowers of *Calochartus maweanus* Leicht on Montgomery Creek, California, and noticed upon them a curious black bee. Although he had no apparatus for collecting insects, he managed to preserve the bee, which reached me rather squashed and broken; but still available for study. Mr. Bethel remarked: "This bee persisted in staying on the Mariposa lily as if he wished to be recorded," and so sent it on. It is presumably an oligotropic visitor of *Calochartus,* and an examination of the mouth-parts indicates that it eats the pollen.

Much to my surprise, this persistent bee turns out to represent a distinct new genus of the subfamily Dufoureinæ (Dufoureidæ of Robertson). The following diagnosis, while incomplete for the reasons mentioned, will make recognition easy. I am glad to name the genus after Mr. Bethel, whose contributions to our knowledge of western botany and zoology have been numerous and varied.

**Betheliella** new genus.

Male, Robust, intense black, with short broad abdomen, the general aspect suggesting *Macropis.*

Head very broad, eyes strongly diverging below; face without light markings; ocelli rather large, in a curved line; scape ordinary; clypeus transverse, very short, like a transverse band; labrum transverse, somewhat longer than clypeus, broadly rounded, not transversely striate, and without basal process, its apex with long hairs; mandibles long and strongly curved, with a well-formed inner tooth near apex; no distinct malar space; cheeks somewhat flattened behind eyes; maxillary palpi long, six-jointed, last joint extending beyond blade, joints measuring in microns (1.) 192, (2.) 176, (3.) 112, (4.) 96, (5.) 80, (6.) 112; broad hyaline intervals between the main (dark brown) portions; basal joint much thicker than second, and having a number of outstanding stiff bristles; last joint slender, with some small bristles at end; maxillary blade broad, the outer (convex) part very thin and pale, the inner (brown) part with a row of hyaline dots; four stiff bristles at apex; tongue only about 880 mu. long, elongate dagger-shaped; paraglossae reaching a little beyond middle of tongue, strap-shaped, with broad-

ened truncate hairy apex; labial palpi 656 mu. long, the joints measuring, (1.) 271, (2.) 192, (3.) 80, (4.) 112.

Mesothorax and scutellum finely punctured, the scutellum with a very shallow median furrow; metathorax distinctly truncate in middle, the area minutely rugulose, microscopically longitudinally striate basally; tegulæ ordinary; anterior wings with well developed lanceolate stigma; marginal cell elongate-lanceolate, ending in a point on costa; basal nervure little bent, its lower end a little apicad of the oblique nervulus; two elongate cubital cells, about equally long, lower side of first with a conspicuous double curve; first recurrent nervure curved, meeting transverse cubital; second cubital cell narrowed more than half above, the second recurrent joining it at a right angle, a little before the beginning of its last third; legs robust, with very stout femora; hind tibiæ broadened apically, on the inner side apically with a large flattened lamina, bearing the simple spurs below, and having a large tuft of black hair; hind femora with no tooth beneath; hind basitarsi long, not especially thickened or remarkable; hind claws bidentate at end.

Abdomen broad, the segments swollen at sides before the apical depression; fourth segment beneath with a pair of large shining bosses.

**Betheliella calocharti** new species.

♂.—Length about 8 mm., anterior wing 7; intense black throughout; pubescence black, long and stiff on face, long and erect on vertex, long on anterior part of mesothorax, on pleura and metathorax and sides of apical part of abdomen; front and clypeus dull; metathorax and scutellum shining, very finely punctured; tegulae black; wings dilute fuliginous, nervures and stigma piceous.

The nearest relative of this genus is perhaps Viereck's *Cryptohalictoides* from Nevada, but although the latter resembles *Betheliella* in the position of the first recurrent nervure, the second recurrent and other features are quite different, according to the published figures. The head and legs are also quite different.

In spite of the superficial resemblance, there is no real affinity with *Macropis*. In *Macropis ciliata* the maxillary blade has long hairs (up to 176 mu.) on apical part, while *Betheliella* has only very short ones, and these not dense. In *M. ciliata* the labial palpi are very stout, the joints measuring about (1.) 176, (2.) 112, (3.) 88, (4.) 112 mu long; the maxillary palpi

with short and very stout first joint; and these palpi do not have the long hyaline intervals between the dark joints. In *Betheliella* the bases of the joints are not abruptly narrower than the apices of the ones before, as is the case in *M. ciliata*. *Panurgus calcaratus* and *P. banksianus* differ by the long tapering maxillary blade, and many other characters. *Rhophitoides canus* is more similar in the mouth parts, but has maxillary palpi extending far beyond the blade, as is also true of *Halictoides campanulæ, H. dentiventris* and *Dufourea vulgaris*. *Hesperapis rhodocerata* has the maxillary blade all dark brown, and maxillary palpi not reaching its end; the first joint of maxillary palpi is short and stout. *Callandrena pectidis* has the stout joints of maxillary palpi broadened at end (except of course the last), and the first joint of labial palpi is longer than the next two united. Various other comparisons gave similarly discordant results, leaving *Betheliella* as a rather isolated type, presumably confined to the Californian region.

The *type* is in my collection, and will eventually go to U. S. National Museum.

## The North American Species of the Genus Hoplogaster (Diptera: Anthomyiidae).

By J. R. Malloch, Bureau of Biological Survey, Washington, D. C.

The genus *Hoplogaster* Rondani is doubtfully distinct from *Coenosia* Meigen, being separable only by the smaller lower calyptra, which does not protrude much beyond the upper one in the males and is much more slender and shorter in the females than in those of *Coenosia*. There is usually also an additional bristle, or weak setula, on the hind tibia at or beyond middle on its posterodorsal surface, which is absent in most species of *Coenosia*.

I present a key for the identification of the North American species known to me but base it on males alone, as that sex only is represented in some of the species I have.

*Key to Species (Males).*

1. Legs black, bases of tibiae narrowly reddish, *californiensis* Malloch
—Legs yellow, tarsi and rarely the femora partly darkened...2

2. Antennae and palpi black; femora partly brownish, the mid and hind pairs at apices; abdomen black, densely bluish gray pruinescent, with four pairs of large subtriangular dark brown spots on dorsum, which form two continuous vittae, the disc brownish gray between the spots, *morrisoni* sp. n.
—At least the third antennal segment and the femora entirely yellow ....................................3
3. Processes of fifth abdominal sternite measured along their inner margin not half as long as basal segment of hind tarsus; humeral angles and at least the propleura yellowish ................................ *nigritarsis* Stein
—Processes of fifth abdominal sternite measured along the inner margin as long as basal segment of hind tarsus; pleura gray ..........................*mollicula* Fallen

**Hoplogaster morrisoni,** sp. n.

♂.—Head, thorax and abdomen black, densely bluish gray pruinescent; antennae and palpi black. Thorax with two suffused brownish dorsal vittae. Abdomen with four pairs of subtriangular dark brown spots on dorsum, one on each of the visible tergites from first to fourth, and forming two broad vittae; fifth sternite and hypopygium black, gray pruinescent. Legs pale yellow, fore femora above and mid and hind pairs at apices browned; tarsi brownish. Wings hyaline, veins yellow. Calyptrae white. Halteres yellow.

Arista pubescent. Abdomen depressed at base; processes of fifth sternite short and broad, the length along inner margin almost as great as that of basal segment of hind tarsus, the latter shorter than usual. Hind tibia with a fine median posterodorsal bristle. Lower calyptra a little protruded. *Length:* 4 mm.

*Type:* White Mountains, New Hampshire (Morrison). U. S. National Museum. Named in honor of the collector.

## Professor C. Sajo, of Hungary.

Professor Charles Sajo, a well-known Hungarian Entomologist, is over seventy years old, and the economic distress under which his country is now laboring is forcing him to dispose of part of his collections. The case is a particularly pathetic one, and I hope that you will feel that you can insert the [enclosed] notice without violating the rules of the Exchange Column.—
K. F. CHAMBERLAIN, Cornwall Bridge, Connecticut.

[The notice in question will be found on our Exchange page. —EDITOR.]

# A New Milliped of the Genus Orthomorpha, Immigrant from the Philippine Islands.

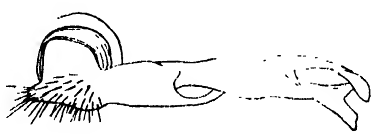
By RALPH V. CHAMBERLIN, Museum of Comparative Zoology, Cambridge, Massachusetts.

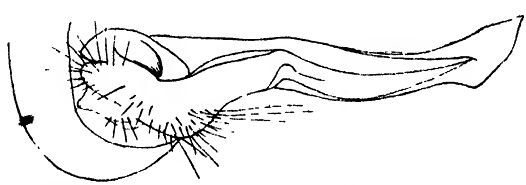
The new milliped which is here described is represented by a male and a female which were intercepted by H. Y. Gouldman at Washington, D. C. These were found in a box with a shipment of orchid plants from Manila, Philippine Islands. They were sent for identification by W. B. Wood, inspector for the Federal Horticultural Board in the District of Columbia.

**Orthomorpha viatoria** sp. nov.

♂. Dorsum black or deep chocolate colored, with a series of reddish dots along the middorsal line, one of these dots covering cauda; lateral borders of keels yellow. Sides of body just below keels also blackish, the middle lateral region reddish yellow and the lower part of sides and the venter yellow. Antennæ blackish like the dorsum. Legs yellow excepting distally where they are brownish.

Sulcus across vertex of head sharply impressed. Antennae of moderate length, slender.





Above, *Orthomorpha viatoria* sp. nov. Gonopod of male, ventral view.
Below, *Chondrodesmus nicaraguae* sp. nov. Left phallopod, ventral view.

Anterior margin of collum evenly convex, the ends of the posterior margin curving forward. The lateral ends or keels of collum rounded.

Dorsum strongly convex, smooth and shining. Furrow between metazonite and prozonite strongly beaded. The keels are very narrow, with anterior corners rounded. Pleural keels occurring on anterior segments in the usual ridge-like form.

Cauda distally truncate. Anal scale broadly subtriangular, the setigerous tubercles small.

Forms of the gonopods as shown in figure accompanying.

Length, about 19 mm.

*Holotype.*—M. C. Z. No. 5217 (♂). *Allotype.*—M. C. Z. No. 5218 (♀).

## A New Leptodesmoid Milliped from Nicaragua.

By RALPH V. CHAMBERLIN, Museum of Comparative Zoology, Cambridge, Massachusetts.

The new milliped herewith described was taken at New York City, Aug. 8, 1923, on bananas forming part of the cargo of the vessel *Sagua* from Nicaragua. It was taken by Ivan Shiller and was transmitted to me for identification by Mr. E. R. Sasscer of the Federal Horticultural Board. The genus *Chondrodesmus,* to which the new form belongs, is characteristic of Central and northern South America.

**Chondrodesmus nicaraguae** sp. nov.

♂.—The dorsum chocolate brown, with the outer portion of keels and the cauda lemon yellow. Legs and antennae very pale, scarcely pigmented.

Anterior margin of collum widely and evenly convex, the posterior margin somewhat arcuate.

Second, third and fourth keels as wide as the fifth, their caudolateral angles rectangular or nearly so and the anterolateral angle rounded and bearing laterally a small tooth.

Porigerous swelling elongate. Posterior angles of keels not produced excepting on sixteenth to nineteenth segments. On the ninth to the thirteenth keels the posterior margin with a broad but low angle or tooth. Posterior margin of eighth keels smooth, not angled or toothed.

Dorsal surface of metazonites roughened; with three rows of small, widely separated tubercles, two of these rows being behind the middle.

Anal scale broad, produced prominently between the setigerous tubercles much as in *C. alidens* Chamberlin.

Accessory blade of phallopods expanded at apex, a crest passing upon the enlarged apical portion from the inner margin as in *spatulatus,* etc. Seminal style distally slender. (See accpanying figure.)

Length, about 34 mm.; width, 6 mm.

*Type* in the Museum of Comparative Zoology, Cambridge, Mass.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., MAY, 1924.

## The Bad Collector.

[Dr. L. O. Howard sends us the following for the NEWS.]

That excellent entomologist, Prof. F. Picard, on taking the presidential chair at the meeting of the Entomological Society of France on January 9th, paid his respects to the bad collector of insects in the following, freely translated, words:

"But alas, I find myself badly qualified to occupy this position when I think of the great number of good entomologists of which our Society is composed. My unworthiness appeals to me strongly on looking at the excellent collectors who surround me. To bring together a good collection is not easy, and demands an ensemble of qualities of which I find myself lacking. It is necessary to be orderly, tenacious and patient. It is necessary to spare neither time nor money, to fear neither journeys nor fatigue, to make numerous arrangements for exchanges, to fight ceaselessly moisture, Anthrenus and verdigris, in order that after years of work one may with pride show competent people the rarest species represented by specimens of an irreproachable freshness and grouped in a perfect order.

"Unfortunately, it is to the group of bad collectors that I confess, to my shame, I belong. The bad collector is endowed with an intermittent zeal. At times he fills, and then he empties his boxes, and he discovers many years later, if indeed Anthrenus has consented to it, that they are neither arranged nor even identified. His boxes are receptacles where he only (at least he so pretends) can find things. His pins are of all different lengths; his labels are of all shapes and colors; his specimens are placed in a secret order which very distantly corresponds to the systematic laws. The bad collector is a sentimentalist. He does not throw away defective specimens; faded butterflies, Coleoptera with three legs, abound in his boxes. Horror! this Longicorn has only one antenna! and as to this Carabid, do not touch it; it will fall to pieces.

"Do not allow yourselves, my dear colleagues, to say *avaunt* to this bad collector. Surely his collection, like hell, is paved with good intentions; and if the labels were all uniform in shape and correctly written it is hardly probable that the specimens would ornament a museum; but the disorder which they present, if it is not artistic in effect, is often the result of assiduous study.

"These unfortunate objects are often the fruit and the testimony of fertile biological research; these mutilated insects from which he cannot separate himself are souvenirs of youth and are bound in his memory to all sorts of charming incidents. As defective as it is, this collection has helped him to pass many happy hours, and it consoles him with the reflection that his life has not been empty."

# Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

## Colias eurytheme—First recorded in Philadelphia, Pennsylvania.

The first record for capturing *Colias eurytheme* Bdv. in southeastern Pennsylvania was made on September 2, 1923, on the meadows outside the Philadelphia Navy Yard.

Mr. Philip Laurent and I had been looking for *Chrysophanus thoe*. After an unsuccessful search of more than an hour, we had put our nets away and were walking back towards the trolley line, when suddenly a deep orange-colored butterfly flew across the road. We both thought it a dark form of *Catopsilia eubule*. There was apparently very little chance of capturing it, for it was flying very fast and with no apparent intention of alighting. It suddenly doubled in its flight, returning within a few feet of where I was. A lucky swoop of my net caught it. It turned out to be a fine fresh male specimen of *Colias eurytheme*. A few minutes later a second *eurytheme* appeared as suddenly as the first and seemed to be in just as much of a hurry to get where the first one had been going.

That second specimen was the hardest butterfly that has ever fallen to our lot to catch. It flew up and down the quarter mile of railroad tracks, back and forth, zigzagging across the stony and marshy meadows and several times up the steep bank

beyond the railroads. But never once in the ten minutes that we both followed it did it ever alight or even attempt to alight. Another lucky swoop caught what proved to be a second male *eurytheme* and slightly torn.

The following morning, Labor Day, we again visited the meadows, hoping to find more; in the hour and half we spent there that day we only saw two more males. We were unable to catch either, for, like the others, they never seemed to alight or even pause in their wild flight.

On September 9th, we again went collecting and Mr. Laurent had the good fortune to capture one of the three males we saw.

On the twenty-second and twenty-third we captured six males and two albino form females, and saw more than ten other males, which we could not get. The most noticeable characteristic of *eurytheme* seems its ability to make lengthy non-stop flights. Of all those we observed only two males were seen at rest.

This seems to be characteristic of the species as Scudder quotes Geddes, as follows: "*Eurytheme* is the most agile and swiftest flying of all the *Eurymi*."

The females, however, were diametrically opposite in their habits. They seemed to be at rest all of the time at the base of plants ovipositing, or on the ground. They apparently only flew up when disturbed by our tramping through the tall herbage. We captured only one typical orange female; all the others were the light colored albino form. It was very difficult to distinguish the females of the *C. eurytheme* from those of our common *C. philodice*. It was only by capturing everything in sight and weeding out and liberating *philodice* that we were able to get the females of *eurytheme*.

W. G. Wright in his monograph on the *Butterflies of the West Coast*, calls attention to the increasing prevalence of the dimorphic female and states that if the present rate of increase goes on the normal orange colored female will become extinct.

On September 23rd we captured two fine specimens of *C. eurytheme* variety *keewaydin*, and this was the only day on which we captured this handsome variation of *eurytheme*.

It seems a curious fact that so many specimens should be seen in such a short time, yet never before recorded in this locality.

The only authentic record for the capture of this species near Philadelphia is by Mr. Caviney in Camden in the year 1890. Other records for this region are: One on Staten Island, New York, by Professor John B. Smith, and a pair from Astoria, Long Island, by Mr. William Beutenmüller.

Dr. Scudder in his great work on the *Butterflies of the Eastern United States and Canada* gives several instances of single "stray" captures from Maine, New Hampshire and Vermont.

As *C. eurytheme* is seasonally polymorphic it will be interesting to note whether any of the other forms will be taken in Philadelphia during the coming summer.—ARTHUR H. NAPIER, 503 E. Willow Grove Ave., Chestnut Hill, Philadelphia, Pa.

## Autobiographies of Entomologists and Arachnologists Wanted!

For years I have been collecting materials for a *Biographic Entomological Dictionary*, to contain biographies of entomologists and arachnologists of all times and of all countries. Biographies of deceased entomologists and arachnologists I have already obtained from the literature almost completely, but to get biographies of living colleagues is much more difficult. Accordingly, autobiographies are wanted, and I hereby beg for such to be sent to me. All entomologists and arachnologists who have done scientific work as authors or as collectors are to be dealt with in this work. The autobiographies will, as far as possible, be printed in the form and the language as sent to me. Those who do not send their autobiographies ought not to expect that their biographies shall be contained in the book. Should anybody be willing to collect contributions for the work, I would beg him to be so kind as to communicate with me. The printing of the work is not in question.—EMBRIK STRAND, Professor of Zoology and Director of the Systematic Zoological Institute of the University of Riga (Latvia), Kronvalda bŭlvars 9. (Entomologist, London, March, p. 68).

[In connection with the above note, reprinted from "our esteemed contemporary," we call attention to the editorial, "The Desirability of a Bibliographical Dictionary of Entomologists" in the NEWS for May, 1914, Vol. XXV, pp. 227-229. EDITOR.]

## A Philatelist.

In *Nature Magazine* for April, 1924, page 208, Mr. H. A. Allard gives an account of insects' sense of taste in which the white portions of a postage stamp has been deleted. "Since only the stamp itself was attacked, while the paper of the envelope upon which it was stuck was not eaten, it would appear that some substance in the adhesive used upon the stamps was attractive to the insects doing the work. In truth a child

could hardly have scraped away with greater precision these areas which the insect, doubtless an ant, has removed by depending, in all probability, upon some highly developed sense of taste or tactual sense." [More likely a Silverfish (*Lepisma*) or a Psocid. EDITORS.]

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of the American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche Cambridge, Mass. **6**—Journal of the New York Entomological Society. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **13**—Journal of Entomology and Zoology, Claremont, Cal. **15**—Insecutor Irscitiae Menstruus, Washington, D. C. **19**—Bulletin of the Brooklyn Entomological Society. **27**—Revue Mensuelle de la Societe Entomologique Namuroise, Namur, Belgium. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **34**—Bulletin de la Societe Entomologique de Belgique, Brussels. **39**—The Florida Entomologist, Gainesville, Florida. **50**—Proceedings of the United States National Museum. **51**—Deutsche entomologische Zeitschrift, Berlin. **52**—Zoologischer Anzeiger, Leipzig. **53**—Bulletin de la Section entomologique du Musee National de Prague. **59**—Journal of Agricultural Research, Washington, D. C. **61**—Proceedings of the California Academy of Sciences, San Francisco. **64**—Parasitology, London. **68**—Science, Garrison on the Hudson, N. Y. **69**—Comptes Rendus des seances de l'Academie des Sciences, Paris. **70**—Journal of Mor-

phology, Philadelphia. **71**—Novitates Zoologicae, Tring, England. **74**—Proceedings of the Staten Island Institute of Arts and Sciences, New York. **77**—Comptes Rendus des seances de la Societe de Biologie, Paris. **82**—The Ohio Journal of Science, Columbus, Ohio. **85**—The Journal of Experimental Zoology, Philadelphia. **87**—Arkiv for Zoologi, K. Svenska Vetenskapsakademien, Stockholm. **90**—The American Naturalist, Lancaster, Pa. **93**—Bulletin, Division of the Natural History Survey, Urbana, Illinois. **96**—Physis, Revista de la Sociedad Argentina de Ciencias Naturales, Buenos Aires. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **105**—Proceedings of the Iowa Academy of Sciences, Des Moines. **114**—Entomologische Rundschau, Stuttgart. **116**—Entomologische Zeitschrift, Frankfurt a. M. **124**—Bulletin de la Societe entomologique d'Egypte, Cairo. **128**—Zeitschrift fur Induktive Abstammungs und Vererbungslehre, Leipzig. **139**—Bulletin of the Southern California Academy of Sciences, Los Angeles. **141**—Internationale Entomologische Zeitschrift, Guben. **146**—"Konowia," Wien. **151**—Occasional Papers of the Boston Society of Natural History. **156**—Genetics, New York.

**GENERAL. Bouvier, E. L.**—La memoire chez les insectes. ("Scientia," Bolognia, xviii, 103-16). **Brues, C. T.**—The specificity of food plants in the evolution of phytophagous insects. **90,** lvii, 127-44. **Campion, Herbert**—Obituary notice. **9,** 1924, 72. **Cockerell, T. D. A.**—Fossil Insects in the U. S. National Museum. **50,** lxiv, art. 13. **Emerton, J. H.**—Early history of the Cambridge entomological club. **5,** xxxi, 1-6. **Erhard, H.**—Eine fernrohrlupe fur insektenforschern. **116,** xxxvii, 56. **Ferris, G. F.**—The study of minute insects. **4,** lvi, 25-8. **Horsfall, J. L.**—The effects of feeding punctures of aphids on certain plant tissues. (Penna. Sta. Col. Agr. Exp. Sta. Bul. 182.) **Longin Navas, R. P.**—Preservation des insectes dans les collections. **27,** 1924, 9-10. **Needham, J. G.**—Observations of the life of the ponds at head of Laguna Canyon. **13,** xvi, 1-12. **Reuss, T.**—Nochmals "blaulingsraupen und ameisen" ein beitrag ueber die "Grenzen des ertraglicher." **141,** xvii, 177-9. **Strand, E.**—Autobiographies of entomologists and arachnologists wanted. **9,** 1924, 68. **de la Torre Bueno, J. R.**—Entomology in non-entomological publications. **19,** xix, 54-5. **Valentine, A.**—Breeding for varieties. **9,** lvii, 91.

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC. Cleveland, L. R.**—The physiological and symbiotic relationship between the intestinal protozoa of termites and their host, with special reference to Reticulitermes flavipes. **100,** xlvi, 178-201 (Cont.). **Finkler, W.**—Die ueberpflanzung von kopfen. (Kosmos, 1924, 16-18.) **Gabritschevsky, E.**—Farbenpolymorphismus und vererbung mimetischer varietaten der fliege Volucella bombylans und anderer "hummelahnlicher" zweiflugler. **128,** xxxii, 321-53. **Hersh, R. K.**—The effect of temperature upon the full-eyed race of Drosophila. The effect of temperature upon the heterozygotes in the bar series of Drosophila. **85,** xxxix, 43-45; 55-71. **de Luna**—A propos de notre note: Sur la participation d'une peroxydaseá l'apparition du pigment chez la Drosophila melanogaster. **69,** 1924, 878-81. **Metz & Nonidez**—The behavior of the nucleus and chromosomes during spermatogenesis in the robber fly, Lasiopogon bivittatus. **100,** xlvi, 153-64. **Mavor & Svenson**—An effect of X-rays on the linkage of mendelian characters in the second chromosome of Drosophila melanogaster. **156,** ix, 70-87. **Mazza, S.**—Sur l'action des venins de vipere et de cobra sur les chenilles de Galleria mellonella. **77,** xc, 669-71. **Plath, O. E.**—Do anesthetized bees lose their memory? **90,** lvii, 162-6. **Voinov et Voinov**—Les cellules pigmentaires dans les larves de Simulium. **77,** xc, 722-24. **Warren, D. C.**—Inheritance of egg size in Drosophila melanogaster. **156,** ix, 41-69.

**ARACHNIDA AND MYRIOPODA. Bromley, S. W.**—A bird in a spider web. **19,** xix, 52-3. **Cockerell, T. D. A.**—The name of the spotted fever tick. **68,** lix, 277. **Hartzell, A.**—Observations on the habits of a tarantula in captivity. **105,** xxix, 187-9.

**Carbonell, J. J.**—Contribucion al estudio de las terafosas argentinas. **96,** vi, 263-282; vii, 46-49, 106-110. **Cockerell, T. D. A.**—(See under General). ***Ewing, H. E.**—New tarsonemid mites. **10,** xxvi, 66-9. **Ewing, H. E.**—Our only common N. Am. chigger, its distribution and nomenclature. **59,** xxvi, 401-3. **Savory, T. H.**—New evidence of the relationship between the spiders Liphistius and Segestria. **11,** xiii, 472-3. **Steding, E.**—Zur Anatomie und Histologie von Halarachne otariae n. sp. **104,** cxxi, 442-493. **Vellard, J.**—Etudes de zoologie. Araneidae—Note preliminaire. Un nouveau genre d'araignees. (Arch. Inst. Vital Brazil, ii, 1-32; 33-40).

**THE SMALLER ORDERS OF INSECTA. Cleveland, L. R.**—(See under Physiology). **Doane, R. W.**—Turret-building Termites. (Nat. His., New York, xxiv, 98-100). **Hoke, G.**—The anatomy of the head and mouth parts of Plecoptera. **70,** xxxviii, 347-85. **McDunnough, J.**—Distributional notes on Canadian dragonflies. **4, lvi, 72-3. Priesner, H.**—Beitrage zur morphologie der jugendstadien der Thysanopteren. (Sitz. Akad. Wissens. Wien., Math.-Naturw. Klas. cxxxii, 1-18).

**Cockerell, T. D. A.**—(See under General). **Ewing, H. E.**—On the taxonomy, biology, and distribution of the biting lice of the family Gyropidae. **50,** lxiii, Art. 20. **Ferris, G. F.**—The mallophagan family Menoponidae. **64,** xvi, 55-66. **Kennedy, C. H.**—Notes and descriptions of naiads belonging to the dragon-fly genus Helocordulia. **50,** lxiv, Art. 12. **Lestage, J. A.**—Notes critiques sur les Campsurus (Ephemeroptera). **33,** 1924, 113-24. ***McDunnough, J.**—New Ephemeridae from New England. **151,** v, 73-6. **Navas, L.**—Crisopidos neotropicos. (Rev. Chilena H. Nat., xxvii, 110-6). ***Claassen, P. W.**—New sps. of North American Capniidae (Plecoptera). **4,** lvi, 43-8.

**ORTHOPTERA. Criddle, N.**—Notes on the early stages of grasshoppers. **4,** lvi, 49-53. **Wille, J.**—Ein neues tibialorgan der Orthoptere Rhipipteryx chopardi. **52,** lviii, 243-53.

**HEMIPTERA. Puri, I. M.**—Studies on the anatomy of Cimex lectularis. **64,** xvi, 84-97. **Webster, R. L.**—Some notes on Empoasca flavescens (Cicadellidae). **105,** xxix, 195-8.

**Blanchard, E. E.**—A new aphidian tribe from Argentina. Aphid notes, pt. IV, Argentine sps. of the subtribe Aphidina. **96,** vii, 24-45; 120-25. **Bruner, S. C.**—A new Enicocephalus (Heteroptera). **19,** xix, 39. **Cockerell, T. D. A.**—The name of the lac insects. **5,** xxxi, 47-8. **Cockerell, T. D. A.**—(See under General). ***DeLong, D. M.**—Some new Cicadellidae from the southern U. S. **6,** xxxii, 63-70. **Esaki, T.**—On the curious Halophilous water strider Halovelia maritima (Gerridae). **19,** xix, 29-34. **Guyton, T. L.**—A taxonomic, ecologic and economic study of Ohio Aphididae. **82,** xxiv, 1-30. ***Mason, P. W.**—A new genus and species of aphids. **10,** xxvi, 49-52. **Muir, F.**—A new genus of the family Achilixiidae (Homoptera). **4,** lvi, 33-4. **Porter, C. E.**—Datos para la zoologia medica de Chile. Description de un nuevo coc-

cido Chileno. (An. Zool. Aplicada, vii, 1920, 16-34. ***Robinson, W.**—Some n. sps. of Erythroneura (Cicadellidae). **4,** lvi, 58-62. **de la Torre Bueno, J. R.**—On a few Heteroptera from Massachusetts. **19,** xix, 48-51. ***Van Duzee, E. P.**—The genus Erythroneura in California. (Homoptera). **61,** xiii, 231-36. ***Woodruff, L. B.**—Critical observations in the membracid genus Cyrtolobus. **6,** xxxii, 1-62.

**LEPIDOPTERA. Bell, E. L.**—A new locality for Copaeodes minima. Libythea bachmani in Long Island. **19,** xix, 43. **Champlain, A. B.**—How butterflies pass the winter. (Nature Mag., Apr. 1924, 223-4). **Engelhardt, G. P.**—The Saturniid moth Coloradia pandora, a menace to pine forests and a source of food to Indians in eastern Oregon. **19,** xix, 35-7. **Fischer, E.**—Wie konnen die sturzpuppen sich aufhangen ohne hinunterzufallen? **116,** xxxvii, 51-2. **Karstens, H.**—Schmetterlinge als Schmuck- und Ziegegenstände. **114,** xli, Nr. 1, 4. **Mellows, C.**—Altitudes at which Lepidoptera occur. **9,** lvii, 90-1. **Poulter, S.**—A study of the white marked tussock moth. **105,** xxix, 165-7. **Wolff, H.**—Gartenblumen fur d. schmetterlingsfang. **141,** xvii, 190.

**Braun, A. F.**—The Chambers specimens of Tineina in the collection of the American Entomological Society. **2,** xlix, 347-58. **Comstock, J. A.**—Studies in Pacific coast L. The rediscovery of a "lost species." **139,** xxiii, 13-6. **Coolidge, K. R.**—California butterfly notes—II. **19,** xix, 44-7. **Hampson, G. F.**—Descriptions of n. gen. and sps. of Trinidad and other S. Am. Noctuidae. **11,** xiii, 425-54. **Joicey & Talbot**—Descriptions of four new butterflies. **9,** lvii, 37-40. **Jordan, K.**—On the saturnoidean families Oxytenidae and Cercophanidae. **71,** xxxi, 135-93. **Lindsey, A. W.**—Iowa microlepidoptera. **105,** xxix, 157-61. ***McDunnough, J.**—Some new Canadian Argynnid races. **4,** lvi, 42-3. **Riley, N. D.**—A new Lycaenid butterfly from Costa Rica. **9,** lvii, 88-9. **Riley, N. D.**—A useless name. [Notice of the genera established by d'Almeida in Etudes sur les Lep. du Bresil, pt. 1 of Melanges Lepidopterologiques, 1922]. **9,** 1924, 67-8. **Stichel, H.**—Kolumbische Heliconius. **51,** 1923, 260-70.

**DIPTERA. Campbell & Davidson**—Notes on aphidophagous Syrphidae of southern California. **139,** xxiii, 3-9. **Hadwen & Fulton**—On the migration of Hypoderma lineatum from the skin to the gullet. **64,** xvi, 98-106. **Johnson, C. W.**—Notes on Muscina pascuorum during 1923. **5,** xxvi, 17-8. **Neri, F.**—Sui significato delle variazioni dell'arma-

tura mascellare in Anopheles maculipennis. (Atti d. R. Accad d. Fis. in Siena, xiv, 433-43). **Pavlovsky u. Stein**—Die Gastrophilus larve als gastparasit in der menschenhaut. **64,** xvi, 32-43. **Thienemann, A.**—Geschichte der Chironomus forschung von Aristoteles bis zur gegenwart. **51,** 1923, 515-40. **Worthley, H. N.**—The biology of Trichopoda pennipes. **5,** xxxi, 7-16.

***Alexander, C. P.**—Undescribed sps. of nematocerous D. from North America and Japan. **15,** xii, 81-4. New sps. of two winged flies from western N. A. belonging to the family Tipulidae. **50,** lxiv, Art. 10. **Bequaert, J.**—Notes upon Surcouf's treatment of the Tabanidae in the genera insectorum and upon Enderlein's proposed new classification of this family. **5,** xxxi, 24-40. **Bonne, C.**—Note on Culex flavipes. **15,** xii, 85. **Borgmeier, T.**—Novos Phorideos Brasiliiros. (Bol. Mus. Nac., Rio de Janeiro, i, 51-59). ***Brues, C. T.**—Notes on some New England Phoridae. **5,** xxxi, 41-4. **Cockerell, T. D. A.**—(See under General). **Curran, C. H.**—On the generic position of Asilus cacophilogus. **6,** xxxii, 73. ***Curran, C. H.**—Notes on the genus Pipizella, with descriptions of n. sps. (Syrphidae). **2,** xlix, 339-45. Synopsis of the genus Chrysotoxum with notes and descriptiona of n. sps. (Syrphidae). **4,** lvi, 34-40. Rhagoletis symphoricarpi, a new trypaneid from British Columbia. **4,** lvi, 62-3. New species of Syrphidae. **151,** v, 79-82. **Dyar, H. G.**—A new Sabethid from Brazil. Note on Culex tarsalis. **15,** xii, 92; 95-6. **Dyar & Shannon**—Notes on Sabethids from Panama. **15,** xii, 85-91. ***Garrett, C. B. D.**—On British Columbian Mycetophilidae. I. **15,** xii, 60-7. **Goetghebuer, M.**—Etude critique des Chironomides de la collection Meigen. **34,** v, 120-9. ***Greene, C. T.**—New sp. of Mythicomyia and its relationship with a n. g. **10,** xxvi, 60-4. ***Johannsen, O. A.**—A n. sp. of Dixa from California. **5,** xxxi, 45-6. ***Malloch, J. R.**—A new sp. of Canacea from the United States. (Ephydridae). **10,** xxvi, 52-3. Exotic Muscaridae. XII. **11,** xiii, 409-24. A new N. Am. species of Amiota. **19,** xix, 51-2. ***Melander, A. L.**—New sps. of Platypalpus occurring in New England. **151,** v, 83-7. ***Shannon, R. C.**—Nearctic Calliphoridae, Luciliini. **15,** xii, 67-81. ***Turner, R. L.**—A new mosquito from Texas. **15,** xii, 84.

**COLEOPTERA. Chittenden, F. H.**—The return of Leptinotarsa juncta to the District of Columbia. **19,** xix, 37. **Flint, Chandler & Glenn**—The apple flea-weevil, Orchestes

pallicornis (Curculionidae). **93,** xv, Art 1. **Frost, C. A.** —Chrysobothris virdigripennis in Canada. **19,** xix, 34. **Jacques, H. E.**—Brood A of the may beetles extends its range in Iowa. **105,** xxix, 163-4. **Lengerken, H. V.**—Prothetelie bei coleopteren-larven. **52,** lviii, 179-85. **Porter, C. E.** —Dos longicornios raros o poco conocidos. (Rev. Chilena H. Nat., xxvii, 52-3). **Wusthoff, W.**—Ueber das praparieren kleiner kaefer. **124,** iv, 29-32 (Cont.).

**Aurivillius, C.**—Neue oder wenig bekannte C. Longicornia. **87,** xv, N. 25. ***Blaisdell, F. E.**—Studies in the Melyridae. II. **2,** xlix, 315-37. **Blatchley, W. S.**—The Chrysomelidae of Florida. **39,** vii, 33-9 (Cont.). **Buchanan, L. L.**—On the systematic position of the carabid, Stereocerus haematopus. **4,** lvi, 40-2. ***Burke, H. E.**—Notes on genus Buprestis with description of one n. sp. **10,** xxvi, 70-2. **Cockerell, T. D. A.**—(See under General). **Hohne, W.**—Neue Cyclocephalen. **51,** 1923, 345-73. **Kleine, R.**—De Brenthidarum Musaei Nationalis Pragae specibus novis. **53,** i, 48-54. **Leng & Davis**—List of the C. of Staten Island, New York. **74,** ii, 1-82. ***Manee, A. H.**—Ecological observations on Rhynchophora in Southern Pines, S. C. **19,** xix, 40-3. ***Notman, H.**—A new xantholinid swarming on gravestones on Staten Island and a new Trogophloeus (Staphylinidae). **6,** xxxii, 71-2. **Obenberger, J.**—Une serie de nouveaux genres de Buprestides. **53,** i, 13-47. ***Swaine, J. M.**—The allies of Ips confusus in western America (Ipidae). **4,** lvi, 69-72.

HYMENOPTERA. **Rabaud, E.**—Le retour au nid de Vespa sylvestris. (La Feuil d. Nat., xlv, 7-11). **Weiss, H. B.**—Parasitic H. from New Jersey. **6,** xxxii, 73-4.

**Bluthgen, P.**—Beitrage zur systematik der bienengattung Halictus. **146,** 111, 63-64 (Cont.). **Brethes, J.**—Sur quelques hymenopteres du Chili. (Rev. Chilena H. Nat., xxvii, 124-8). **Cockerell, T. D. A.**—Expedition . . . to the Gulf of California in 1921. The bees (II). **61,** xii, 529-60. **Cockerell, T. D. A.**—(See under General). **Friese, H.**—Neue formen der bienengattungen Centris-Epicharis. **146,** iii, 19-22. **Girault, A. A.**—The N. American sps. of Emersonopsis, Amestocharis, Euderus and Miromphalomyiia. (Chalcicidae). **15,** xii, 93-5. **Mann, W. M.**—Notes on Cuban ants. **5,** xxxi, 19-23. **Pfankuch, K.**—Die typen der Gravenhorst'schen gattungen Phytodietus und Ischnocerus.

146, iii, 41-51. **Schmiedeknect, O.**—A short summary of the section Tryphonides prosopi. (Ichneimonidae). **9, 1924,** 45-8. ***Viereck, H. L.**—Descriptions of new reared H. from Nova Scotia and British Columbia. **4,** lvi, 64-9.

## SPECIAL NOTICES

**The Macrolepidoptera of the World.** Fauna americana, Pts. 133-35, English edition, have just appeared. These parts continue the treatment of the Hesperiidae, and include the genera from Thespieus to Hylephila.

We have received Numbers 1, 2 and 3 of Volume I of the **Monthly Common Insect Magazine, 1923,** edited by Motojiro Suzuki, Hanazono Entomological Laboratory, Hanazono-Taniguchi, Kyoto, Japan. The first number contains 48, the second 38, the third 41 pages, the first a 4-color plate of Japanese Lucanidae, the second a 4-color plate of Japanese Diurnal Moths (Chalcosiinae), the third a color plate of Japanese Longicorns. Subscriptions are 4 yen, post free, and should be sent to the Editor. Excepting the statements above quoted from the cover, the explanation of Plates II and III, and a brief article in number 3, everything about and within the journal is in Japanese and a closed book to us. We hope it may be of great service in its own country.

### A Reply to Dr. Kinsey.

EDITOR, Entomological News: As students of Dr. MacGillivray, who are working on the outlines contained in his *External Insect-Anatomy,* may we be allowed space to reply (unknown to Dr. MacGillivray) to a review of this book by Dr. Kinsey, published in the January, 1924, number of *Entomological News*? We represent the sufferers whom Dr. Kinsey has championed and, while thanking him for his efforts on our behalf, may we present certain phases of the question which he has overlooked?

According to his statement, "For the better part of a century taxonomy has been losing caste . . . . If there are adequate reasons for the decadence of systematics, they must lie in the way we systematists have been doing things, and the sooner we learn to do them differently the sooner taxonomy will engage the interest and esteem of other biologists." As we see it, taxonomists have put forth a vast amount of conflicting literature through trying to co-ordinate end-points of development or ultimate types without working systematically through the steps along which these types have severally evolved. There

has been no common basis in their training or methods, so that it is rare to find any two thinking alike, and still more rare to find any two publishing alike, on the same material.

As Dr. Kinsey maintains, what are needed in the training of future systematists or taxonomists, are "worth-while . . . principles employed in making keen distinctions;" the power "to recognize scant differences, to utilize obscure and varied data, to co-ordinate conflicting evidence, to know the inadequacies of conclusions, the necessity for wary judgments." In no better or more fitting words could he have defined the value of MacGillivray's *External Insect-Anatomy.* Any student with any inclination for entomology cannot help but acquire such a training and powers by working through the manual or even selected parts of it; it is precisely the method required to teach students "to recognize scant differences, to utilize obscure and varied data." Furthermore, it is the only volume relating to insect morphology and taxonomy, of which we are aware, that concisely develops this analytical method. The subject matter is of a nature which demands that the instructor presenting it be adequately trained, the kind of instructor who knows better than to present a beginner with a minute discussion of the thorax, instead of starting at the beginning of the book.

We are told that the "meat and dessert of this new course . . . . are words, big words, new words, strange and fearful words." It is very obvious that Dr. Kinsey has not read enough of the book to perceive what the author sets forth in his preface and which speaks from every page, namely, the promotion of a uniform system of terminology. It is the first time that the morphology of a series of widely differing insects has been treated as a whole, and the system employed is, of necessity, one of an exacting and uniform nature. It gives to Entomologists a system analogous to that used to so great an advantage by chemists. To the man in the street, "tummy" is a popular name for stomach; to a chemist, Acetophon is a trade or popular name for monoaceticacidester of salicylicacid . . truly a formidable name to the student taking chemistry for the first time. But who would give such a term to a freshman in chemistry without first grounding him on the principle on which the term is built up? To a chemist, every syllable of this terrible word means something very definite. In the same way, to a student who works through *External Insect-Anatomy* from the beginning, such terms as meso-coxa-cava, meso-troca-suture (the hyphens are ours) bring to mind something very definite and intelligible. All the other terms employed by the author are perfectly in keeping with his system.

Even if Dr. MacGillivray's intensive system of terminology be not generally adopted in its entirety, his system of instruction certainly provides students with an analytical training in morphology and taxonomy more thorough and complete than any other system yet produced. It is a training and system which has already brought forth results, and, as students of several grades of entomological standing, we find that we can assimilate *External Insect-Anatomy* in the hours assigned without burdening our souls or wearying our bodies. In the case of men already engaged in active entomological work, there are some, no doubt, who may find this book apparently very cumbersome and perplexing; to students acquiring a knowledge of morphology for the first time, as we are, it presents no such hardships as Dr. Kinsey anticipates.

A. E. BEARDSLEY, G. E. KING, DAVID D. QUESTEL, WALLACE COLMAN, PAUL KNIGHT, G. J. SPENCER, E. G. KELSHEIMER, BOYD B. PALMER, P. H. WILLEY, MARGARET WINDSOR

*Present Students of Dr. MacGillivray.*

# Doings of Societies.

## The Entomological Section of the Academy of Natural Sciences of Philadelphia.

Meeting of September 27, 1923. Director Philip Laurent in the chair; ten persons present.

GENERAL.—The spring excursion to Castle Rock was discussed and exhibits made; Mr. Cresson reported the discovery of two new species of Diptera in his collection. Dr. Calvert exhibited a photograph of the bronze tablet commemorating the services to natural sciences and the British Museum, of F. D. Godman and O. Salvin. Dr. Calvert called attention to several recent criticisms of the Comstock-Needham wing venation terminology, which brought forth general discussion on the merits and defects of that system.

LEPIDOPTERA.—Dr. Skinner exhibited lepidopterous larvae which were sent to the Academy as being injurious to dahlias in cultivation; he could not determine the species. Mr. Hornig exhibited larvae of *Chlorippe clyton* in a breeding jar. He also exhibited specimens of *Colias amphidusa* var. *keewaydin*, captured in the city September 10th; also specimens of *Vanessa j-album*, captured here August 28th. Mr. Laurent reported the

capture, by Arthur H. Napier, of *Eurymus amphidusa,* on September 2nd, on the meadows in the lower part of Philadelphia. The speaker stated that to the best of his knowledge, this was the first record for this butterfly in Philadelphia or its vicinity.

ODONATA.—Mr. Laurent exhibited a pair of *Celithemis eponina,* which he had collected on Deal Lake, near Palatine, New Jersey, on July 27, 1923, when this species was very common. The male has the bands on the wings complete, while in the female the nodal band was broken into two distinct spots on both front and hind wings. The pterostigmal band of the female was very narrow (2.5 mm., maximum). Mr. Laurent presented this female to the collection of the Academy. Dr. Calvert made an interesting communication on the genus *Philogenia,* showing the specific differences in the genitalia of some of the species. Dr. Calvert also reported the presentation of the type of *Enallegma pallidum* Root, to the collection by its describer, Dr. F. M. Root.

COLEOPTERA.—Mr. Haines reported digging up a colony of *Copris carolina* at Riverton, New Jersey.

ORTHOPTERA.—Mr. Hornig exhibited specimens of *Gryllus domesticus* and reported finding them in large quantities in some houses in West Philadelphia; he said that they were observed swarming in masses at night, apparently coming from nearby dumps.

---

Meeting of November 15, 1923. Director Philip Laurent presiding; eight persons present.

GENERAL.—Dr. Skinner spoke about the trouble which the last tariff law has given the students of entomology, and the inconvenience it has given him on consignments sent to the Academy, especially when the same were addressed to individuals in the Academy. The speaker also told of the measures he has taken in trying to remedy the situation.

The death, November 7, of Mr. Philip Nell, a Contributor, was announced, and on motion it was voted that a letter of regret and condolence be sent to his sister.

Mr. R. T. Davis was elected a Contributor.

LEPIDOPTERA.—Dr. Skinner called attention to the latest volume of *Etudes de Lepidopterologie Comparee,* by Charles Oberthür, a copy of which was exhibited. He considers this one of the finest entomological works at present published, and that the quality of the illustrations cannot be surpassed; it not only figures the insects but in numerous cases photographs of the habitats of types are given. The illustrations of the Boisduval types of American species, presented in several of the earlier

parts, have made possible the identification of those species, many of which were not thoroughly understood.

DIPTERA.—Mr. Cresson exhibited the Academy's collection of the dipterous family Micropezidae, containing some 350 specimens, representing 90 species and 25 genera. This represented a growth since 1900 from 100 specimens, 5 genera and 11 species, when the speaker began the study of this family.

---

The annual meeting of December 10, 1923. Director Philip Laurent in the chair; eight persons present.

The Treasurer's report showing a balance of $67.47 was read and on motion referred to the audit committee. The treasurer's report of the Entomological News account was also read, showing a deficit of $334.16. This condition was discussed by Dr. Calvert, who showed that the deficit was more apparent than real, being mainly due to the delay in the renewals which usually come in early.

On motion the meetings for 1924 will be called at 7.30 P. M. on the following dates: Fourth Thursdays of January, May, September, third Thursday of November, and second Monday of December.

On motion a committee on Excursions was voted, consisting of Messrs. Williams, Rehn and Cresson, Jr., appointed by the chair.

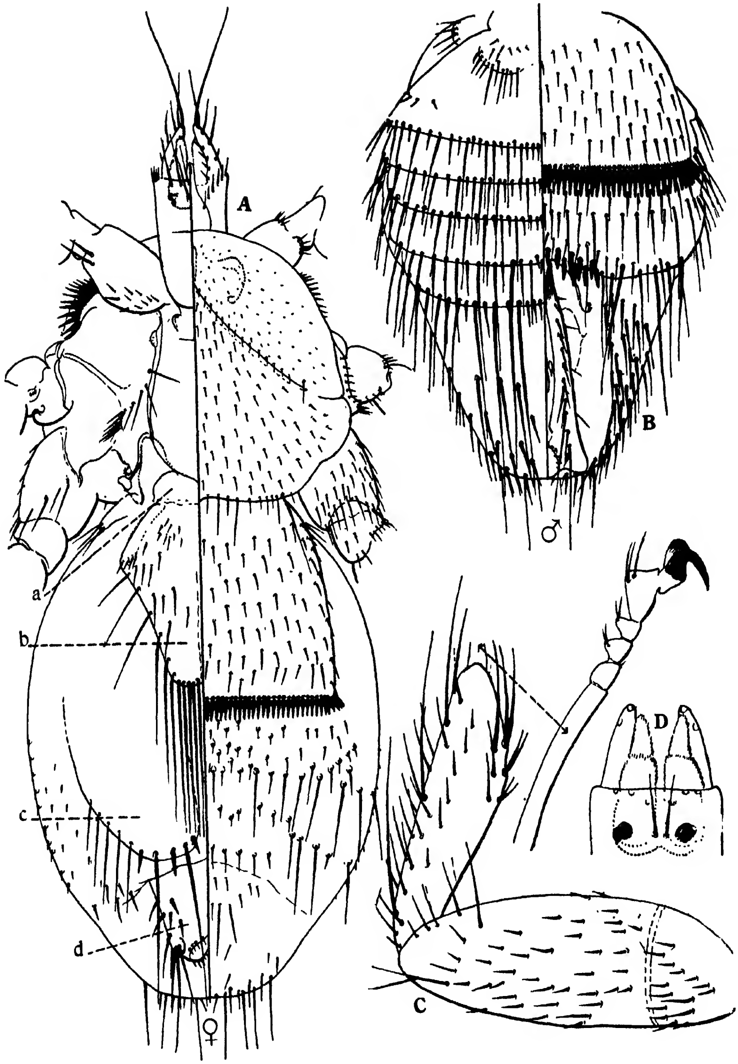
The following officers and committee were elected to serve during the ensuing year: *Director,* Philip Laurent; *Vice-Director,* Roswell C. Williams; *Secretary,* James A. G. Rehn; *Treasurer,* Ezra T. Cresson; *Recorder,* Ezra T. Cresson, Jr.; *Conservator,* Henry Skinner; *Publication Committee,* E. T. Cresson, Philip P. Calvert and E. T. Cresson, Jr.

ODONATA.—Dr. Calvert made an interesting communication on the distribution of the species of the odonate genus *Philogenia,* followed by general discussion on the distribution of insects.

E. T. CRESSON, JR., *Recorder.*

## OBITUARY.

With regret we record the deaths of HERBERT CAMPION at London, England, January 24; of Dr. L. PERINGUEY at Capetown, February 20; and of Prof. A. D. MACGILLIVRAY, at Urbana, Illinois, March 24. We hope to present notices of their work in entomology in later issues of the NEWS.




BASILIA SPEISERI (RIBIERO). A, FEMALE; B, ABDOMEN OF MALE; C, ANTERIOR LEG; D, EYES. IN FIGURES A AND B THE LEFT HALF IS THE DORSAL, THE RIGHT HALF THE VENTRAL, ASPECT.—FERRIS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV JUNE, 1924 No. 6

CONTENTS



## The New World Nycteribiidae (Diptera Pupipara).

By G. F. FERRIS, Stanford University, California.

(Plate III and Text figure 1)

The bat-infesting family Nycteribiidæ, of the Diptera Pupipara, seems to be very weakly represented in the Western Hemisphere. Up to the present time but eight species have been described from North and South America together, while from the remainder of the world approximately sixty have been recorded. This disparity has been noted by Speiser and Scott, the two recent authorities upon the group, and that it actually expresses a biological condition is attested by the experience of the present writer.

Some years ago I examined the alcoholically preserved bats in the United States National Museum, going over the entire collection. The examination was quite fruitful, so much so that the resulting collection of bat parasites is probably among the largest now extant. The American bats were naturally well represented in the material examined, yet from them but three species of Nycteribiids were obtained. It became very evident

in the course of the examination that the American bats are actually much less infested, both in regard to the number of individuals as well as the number of species of parasites than are the Old World bats. The actual center of abundance seems to be in the region of the Indian Ocean, as the two authors mentioned have previously noted.

In presenting a report upon the available American material of the Nycteribiidæ, I am taking advantage of the opportunity to give a resumé of the group as represented in the New World. The material upon which the report is based has come largely from the bats in the National Museum, although certain material from other sources is available. Representatives of all the species obtained from the National Museum will be deposited in the collections of that institution. The remainder of the material is in the Stanford University collection.

## The New World Genera.

The New World species of this family have been referred to under five generic names, *Nycteribia, Penicillidia, Cyclopodia, Basilia* and *Pseudelytromyia*. Of these I am recognizing but two, *Basilia* and *Nycteribia*. The reasons for rejecting the others will be discussed in connection with the last two genera.

These two genera may be recognized by the following key, which is based upon the work of Speiser and Scott.

1. With distinct thoracic and abdominal ctenidia; tibiæ not ringed.
2. Eyes present, two-facetted.............. *Basilia*.
   Eyes entirely lacking................ *Nycteribia*.

## Genus **Nycteribia** Latr.

Two North American species, *N. mexicana* Bigot and *N. antrozoi* Townsend, originally described in this genus, are now referred to *Basilia*. Two South American species, *N. flava* Weyenberg and *N. bellardii* Rondani, are retained in it, for the present at least, although in the case of the former the position is doubtful.

**Nycteribia bellardii** Rondani.

1878. *Nycteribia bellardii* Rondani, Ann. Mus. Civ. Genova 12:152.

1901. *Nycteribia* (*Acrocholidia*) *bellardii* Rond., Speiser, Arch. f. Naturgesch. 67 (1):46.
*Records.* From *Phyllostoma* sp., Brazil.

**Notes**: Speiser (ref. cited) has redescribed the female of this species. Its position as a member of the genus *Nycteribia* may be regarded as fairly definite.

**Nycteribia flava** Weyenberg.

1881. *Nycteribia flava* Weyenberg, Ann. Soc. Cientif. Argentina 11:104.
1901. *Nycteribia* (*Acrocholidia*) *flava* Wey., Speiser, Arch. f. Naturgesch. 67 (1):62.
*Records.* From *Vespertilio* (*Vesperugo*) *velatus,* Argentina.

Notes: Speiser has merely listed this species, apparently with doubt, under the sub-genus *Acrocholidia* of *Nycteribia.* I have not seen the description.

Genus **Basilia** Ribiero.

1903. *Basilia,* Ribiero, Archivos do Museo Nacional do Rio de Janeiro 12:175.
1907. *Pseudelytromyia,* Ribiero, ibid. 14:233.
1908. *Basilia,* Speiser, Zeits. f. Wiss. Ins. Biologie 13:437.
1913. *Cyclopodia,* Brethes, Bol. del Museo Nacional de Chile, pp. 1-4, figs.

The genus *Basilia* is distinguishable from *Penicillidia* only by the fact that in the former the eyes are two-facetted, while in the latter they are one-facetted. This distinction holds and may possibly be valid, although I am somewhat inclined to be dubious as to its importance. Actually *Penicillidia dufouri* (Wesw.), the type of *Penicillidia,* is not so very different from the forms referable to *Basilia* and I have, in the case of some other members of the family, seen some evidence that the character of the eyes is likely to be misleading. However, I am accepting the genus *Basilia.* On the other hand the genus *Pseudelytromyia,* as Speiser has pointed out, seems not at all worthy of separation from *Basilia.*

Brethes (ref. cited) seems to have been very much confused as to generic characters in this group, inasmuch as he placed *Basilia* as a synonym of *Cyclopodia.* There is no evidence that *Cyclopodia* occurs in the New World.

A discussion of the generic characters of the genus *Basilia*

may not be out of place and may be illustrated by reference to the figures of *B. speiseri* (Ribiero) (Plate III).

In the four species examined by me there is a rather close adherence to a certain general type. The head appears to be normally rather elongate and slender, although in some specimens it is somewhat conical, probably because of distortion. It is almost destitute of setæ except for a very few between and in front of the eyes and along the cephalic margin. The eyes are usually distinctly two-facetted, although in some specimens the facetting is somewhat obscure, possibly because of an unfavorable angle of view. The palpi are characteristically slender and tipped by a long seta and several other shorter setæ.

The thorax is in general somewhat wider than long, without any markedly distinctive characters. The thoracic ctenidia are well developed and contain numerous teeth. The legs (Pl. III, Fig. C) have the femur and tibia slightly flattened, the latter strongly haired, the setæ on the inner margin especially stout and arranged in two or three series on the apical half.

The abdomen of the female, as in all the members of the family, is difficult to describe because of the extensive membranous areas and the difficulty of homologizing the parts. After a careful comparison of the four species available I have adopted the view that there are four dorsal areas which may be homologized throughout. These four areas appear as the tergites of individual segments but that they are so is extremely doubtful. It is possible that they are really compound, being formed by the fusion of two or more segments. In order to avoid an expression of opinion as to which segments they may represent I am simply referring to them as tergites *a, b, c* and *d*. Tergite *a* (the basal tergite) varies from a very small piece in *B. speiseri* to one occupying nearly one-third of the dorsal aspect of the abdomen in *B. antrozoi*. Tergite *b* is divided by a longitudinal median suture into two lobes which may be approximate as in *B. speiseri* and *B. forcipata* or very widely separated as in *B. corynorhini*. The apices of these lobes are usually beset with long setæ but are not so in *B. corynorhini*. Tergite *c* consists of a pair of lobes separated by a median membranous area as in *B. speiseri, corynorhini* and

*antrozoi* or fused into a single piece as in *B. forcipata.* It is characteristically tipped by long setæ. Tergite *d* is a part of the apical segment which bears the anus. At times this segment may be so retracted that it is scarcely visible from the dorsal aspect.

The ventral side is even more difficult to describe definitely because of the greater membranous areas. There are seven pairs of spiracles, these borne along the lateral margins and usually somewhat difficult to distinguish because of their small size and the numerous setæ and tubercles. The basal sternite bears a ctenidium with as many as sixty teeth.

The male is similar to the female in the form of head and thorax, but as in all the members of the family, the abdomen is very different. There are seven very evident segments visible dorsally and there are seven pairs of spiracles but not more than five sternites can be recognized. The terminal segment is very broad and blunt and in all the species examined the forceps are long and slender. Specific characters are very poorly marked and the recognition of species from this sex when not associated with the female is very dubious. Species should not be described from the males alone.

**Basilia ferruginea** Ribiero.

1903. *Basilia ferruginea* Ribiero, Archivos do Museo Nacional do Rio de Janeiro 12:175-9; pl. (Des. of male).

1907. *Basilia ferruginea* Rib., Ribiero, ibid. 14:231-2. (Des. of female).

*Records.* From *Vespertilio aurantcus,* Minas Geræs, and *Atalapha frantzii,* Rio de Janeiro, Brazil.

Notes: The description of the male given by Ribiero is accompanied by an excellent figure, but unfortunately that of the female is not and will scarcely permit its positive recognition. As I have pointed out this practically precludes the identification of the species.

**Basilia mexicana** (Bigot).

1885. *Nycteribia mexicana* Bigot, Ann. Soc. Ent. France (6) 5:245.

1902. *Penicillidia mexicana* (Bigot), Speiser, Zeits. f. syst. Hym. und Dipt. 2:171-2.

*Records.* From undetermined host in Mexico.

Notes: Speiser (ref. cited) has redescribed the type of this species but it is very doubtful that the species can be recognized from this redescription. This author regarded the species as possibly the female of *B. antrozoi* (Townsend) but at the best this was merely a guess. I am referring it to *Basilia* simply on the basis of probabilities, although there is no information as to the character of the eyes.

**Basilia antrozoi** (Townsend).

1893. *Nycteribia antrozoi* Townsend, Jn. N. Y. Ent. Soc. 1:79. (desc. of male).

1902. *Penicillidia mexicana* (Bigot), Speiser, Zeits. f. syst. Hym. und Dipt. 2:172.

1916. *Penicillidia antrozoi* (Townsend), Ferris. Ent. News 27:434-5; pl. 22, f. 1-2. (Desc. of male and female).

*Previous records.* Recorded by Townsend from *Antrozous pallidus* in New Mexico and by Ferris from *A. pallidus pacificus* in California.

*Specimens Examined.* Those upon which the previous record by Ferris was based and the following: from *Antrozous pallidus pacificus,* Dulzura, Calif. (U. S. N. M.) and Stanford University, Calif. (J. C. Chamberlin): *A. pallidus minor* and *Myotis californicus,* Santa Anita, Lower California, Mexico (U. S. N. M.): *Corynorhinus macrotus pallescens,* East Painted Cave, Texas (U. S. N. M.): *Nyctinomus cynocephalus,* New Orleans, La. (U. S. N. M.).

Notes: While this species appears to be characteristically a parasite of *Antrozous,* the records given above indicate its occurrence on other hosts, unless there has been some mixing.

**Basilia corynorhini** (Ferris).

1916. *Penicillidia corynorhini* Ferris, Ent. News 27:435-6; pl. 23, f. 3.

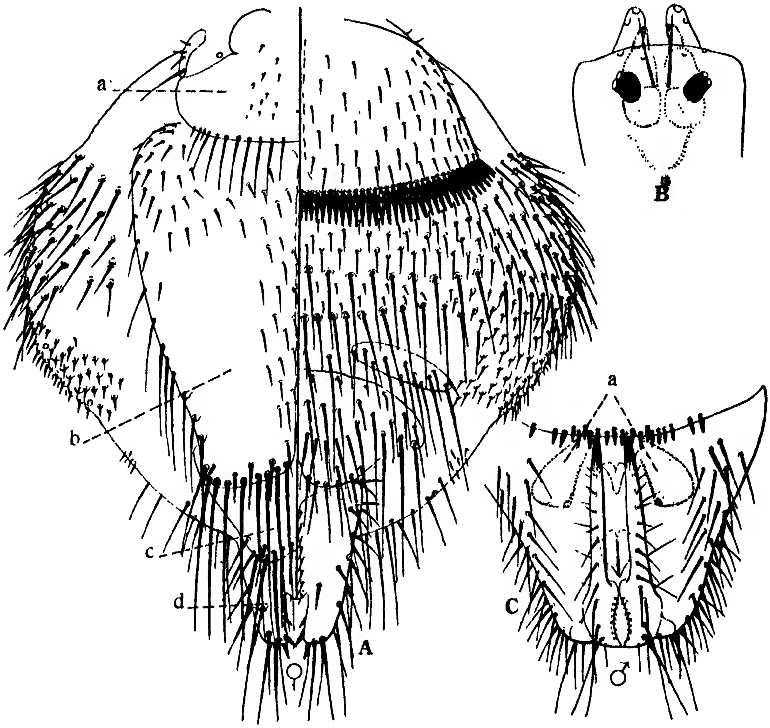
*Records.* Known from a single female from *Corynorhinus macrotus pallescens.*

Notes: I have nothing to add to the original description.

**Basilia forcipata** n. sp., Text-fig. 1.

*Specimens examined.* Holotype (a female) and allotype and one paratype male from *Myotis californicus quercinus,* Covina, Calif. (A. B. Howell): a single female from *Nyctinomus cynocephalus,* New Orleans, La. (U. S. N. M.): four females from *Myotis thysanodes,* Cloverdale Hills, New Mexico

(U. S. N. M.), one female from the same host at Hacienda La Parada, San Louis Potosi, Mexico and one from the same host at Old Fort Tejon, Calif. (both U. S. N. M.).




Text Fig. 1.—*Basilia forcipata* n. sp. A, abdomen of female, the left half the dorsal, the right half the ventral aspect; B, eyes; C, terminal abdominal segment of male from ventral aspect.

♀.—Length 2 mm. *Head* with the normal characters of the genus, the eyes (Fig. *B*) deeply pigmented and distinctly two-facetted. *Thorax* without distinctive characters.

*Abdomen* (Fig 1*A*) with the apparent first tergite (*a*) quite large and with a row of setæ along the posterior margin; second tergite (*b*) much elongate, occupying the greater part of the dorsal aspect of the abdomen, slightly narrower at the apex than at the base, divided longitudinally by a faint median suture; the surface with numerous small setæ, the lateral margins with slender setæ which become longer toward the apex,

the apex with a row of about eight long, stout setæ on each lobe. Third tergite (*c*) quite short and broad, partially concealed by the second, with a cluster of three or four long and several smaller setæ at each apical angle. Terminal segment (*d*) quite strongly chitinized, deeply divided into two rather slender lobes each of which bears three or four moderately long setæ at the apex, several stout setæ along the inner margin and a series of quite long setæ along the outer margin.

Basal sternite occupying perhaps one-third of the length of the abdomen, beset with numerous short setæ and with a ctenidium of approximately sixty teeth. The connexivum caudad of the basal sternite bears two distinct transverse rows of long setæ and is thickly beset with short setæ which extend somewhat to the dorsal aspect. Caudad of these setæ is a pair of small, oval plates, each with a number of moderately long setæ. Caudad of these is a short, broad plate with numerous slender setæ and caudad of this the terminal segment.

♂.—The male is of the type common to the genus, so very closely resembling that of *B. speiseri* that it is scarcely distinguishable. It seems to be characterized chiefly by the presence on the terminal segment of a pair of internal chitinous structures (Fig. 1 *C,a*) of doubtful homology. Length 2 mm.

Basilia speiseri (Ribiero). Pl. III.

1907. *Pseudelytromyia speiseri* Ribiero, Archivos do Museo Nacional do Rio de Janeiro 1:233-5; pl. 23; pl. 24, f. 2-4.

*Previous records.* From *Atalapha frantzii*, Quinta de Boa Vista, Rio de Janeiro, Brazil.

*Specimens examined.* Eleven females and ten males from *Myotis nigricans*, Sipurio, Costa Rica (U. S. N. M.).

Notes: The description and figures given by Ribiero are sufficient to permit the reasonably certain determination of the species, but as it has been used as the type of a genus I am here figuring and describing it in somewhat more detail.

♀. (Pl. III, Fig. *A*).—With the general characters of the genus as described. Abdomen with the basal tergite (*a*) very small and inconspicuous, without setæ. Second tergite (*b*) occupying about one-third of the length of the abdomen, divided by a faint median suture into two lobes, each of which bears six to eight, long, slender setæ at the apex and a few slender setæ along the margin. Third tergite (*c*) composed of two well separated, broad lobes which are destitute of setæ except along the posterior margin where there are two or three very long and two or three short, stout setæ and along the lateral margin where

there are a few slender setæ. Tergite four (*d*) short, the apices of the inconspicuous lobes with three or four stout setæ.

Basal sternite occupying nearly one-half the length of the abdomen, the ctenidium with approximately sixty teeth. Remainder of the ventral side entirely membranous. Four transverse rows of setæ of various lengths may be distinguished and the surface is sparsely beset with small, scattered setæ.

♂. (Pl. III, Fig. *B*).—The male presents no specially distinctive characters and I am unable to indicate any positive characters by which it may be separated from the male of *B. antrozoi* or, on the basis of Ribiero's figure, from the male of *B. ferruginea*. From the male of *B. forcipata* it may be separated as indicated in the description of the latter.

**Basilia silvae** (Brethes).

1913. *Cyclopodia silvæ* Brethes, Bol. del Museo Nacional de Chile, pp. 1-4, figs.

Notes: The original description of this species is not available to me. I am referring it to *Basilia* on the basis of a statement by Scott[1] to the effect that Brethes had placed *Basilia* as a synonym of *Cyclopodia*, which it certainly is not and on the basis of a strong probability that *Cyclopodia* is not represented in the New World.

## The Life-History of Mitoura loki Skinner (Lepid.: Lycaenidae).

By Karl R. Coolidge, Hollywood, California.

*Mitoura loki*, known only from Southern California, was described from specimens taken by W. S. Wright, at Mt. Springs, San Diego County, California, July 5th, 1906, and this type locality appears to be the only habitat thus far recorded. On May 31st, 1920, I caught a worn female of *loki* in Mint Canyon, about fifty miles northeast of Los Angeles, a region very similar to that in which the species was discovered. This past season *loki* was found to be plentiful in this locality and long series were netted by local collectors.

On April 29th, I took twenty specimens, mostly fresh females. The males were more or less worn, indicating that the species had been in flight a week or more. Mint Canyon leads into

[1] Scott, H. Parasitology 9:606. (1917.)

Palmdale, where begins the Mohave Desert, and it is here that the Juniper belt becomes a conspicuous part of the flora, though isolated clumps of Juniper are to be found but a few miles out of Los Angeles.

California Juniper (*Juniperus californica* Carr) is a bushy shrub two to fifteen feet high, or sometimes a tree up to twenty-five feet in height. It is at home principally in the arid desert foothills, being most abundant on the western Mohave Desert, especially along the desert slopes of the Sierra Madre, Sierra Liebre, Tehachapi and San Bernardino ranges. Southward, the Juniper belt continues along both slopes of the San Jacinto Mountains into Lower California; northward, in the Sierra Nevadas to Kern River Valley, and at scattered intervals along the inner Coast Range as far north as Mt. Diablo, in Contra Costa County; westward, to the San Rafael Mountains. A narrow belt also occurs in Lake County. It is quite possible that *loki* will be found to occur throughout the entire range of its food-plant.

Three female *loki* were confined with sprigs of Juniper on April 29th, and on the following day five eggs were laid. A time record of the transitions follows:

| | |
|---|---|
| Eggs laid April 30th. | Passed third moult June 16th. |
| Hatched May 9th. | Passed fourth moult June 28th. |
| Passed first moult May 20th. | Suspended July 8th. |
| Passed second moult June 4th. | Pupa disclosed July 11th. |

As Mr. Wright's specimens were taken in July, and mine in April, I suspected that there might be two broods, and so visited Mint Canyon on a number of occasions throughout July. No imagoes were encountered, however, and as my pupae also failed to disclose, I am now satisfied that there is but one brood and that the flight of this extends over a considerable period of time.

The eggs are placed on the tips, or close to the tips, of the food-plant, sometimes tucked in between the chinks of the overlapping scales. In all cases where I found the eggs in nature, the concealment was very poor, the eggs showing up conspicuously against the dark green coloration of the food-plant.

In hatching, the young larvae escape by eating out rather

large holes in the summit or side of the egg, more often the latter, and once free from the shell do not devour any more of it. The habits of the larvae are very similar to those of other species of *Mitoura*. They attack only the tips of the sprigs of Juniper, the first thoracic segment covering the head while feeding as though with a cowl. During the moulting periods the larvae crawl back a considerable distance from the tips.

*The Egg.*—In shape a greatly depressed echinoid, with the summit but slightly depressed and as broad as the base. The micropyle not greatly depressed, .10 mm. in diameter, of a deeper green than rest of egg; the micropyle rosette composed of about a dozen nearly uniform round cells, .02 mm. in diameter, outlined in but scarcely raised yet distinct delicate lines.

Surface of egg profusely studded with large elevated conical protuberances, .02 mm. in height and .04 mm. in breadth at base, connected with one another by fairly distinct, slightly irregular ridges, which run up the protuberances as buttresses. These conical protuberances, with their connecting ridges, form quadrate or subtriangular cells, averaging .04 mm. in diameter, and not disposed with any definite regularity. The surfaces of the cells minutely punctate.

Color, a very delicate pale green, with the raised net-work white. Diameter .76 mm. Height .42 mm.

*Larva, First Instar.*—Head smooth, shining, pale brown, .24 mm. in width; ocellar field black; frontal triangle outlined in reddish brown; mouth parts red brown.

A supralateral series of papillae, one to a segment on either side, located on anterior margin of segment and bearing a short, straight, sharp, colorless, spiculiferous hair, but .06 mm. in length. A laterostigmatal series of papillae, one to a segment on either side, located in line with the supralateral series and bearing hairs of about the same length. Two laterodorsal conical papillae on either side, with the arising hairs .60 mm. in length, colorless, spiculiferous, arcuate. These papillae are nearly equal, centrally located on the segments, .04 mm. in height, of the body ground color except the summit, which is fuscous-ringed.

Substigmatally, four fuscous papillae, bearing outwardly directed, fairly straight, sharp, colorless, rather heavily spiculiferous hairs, .20 mm. in length. Between the laterodorsal series of papillae and the stigmata two smooth naked hemispherical lenticles, the inner one the larger, .02 mm. in diameter; the outer .01 mm. in diameter, and a little back of the larger.

On the last compound segment a curving series of similar lenticles, slightly unequal in size, just ahead of a circular coriaceous depression. On first thoracic a similar but lozenge-shaped shield, laterally produced. Stigmata obovate, .009 mm. in diameter, with a fine fuscous ring.

Color of body a rather deep lemon yellow, somewhat tinged with green along the dorsal area. As the larva feeds it becomes more and more of a dark green, with irregular blotchings of reddish brown, until finally the original coloration is entirely obscured. Ventral surface and prolegs slightly brighter yellow than above; legs very pale subhyaline shining yellow. First thoracic segment pallid.

Length, at birth, 1.18 mm. Width at first thoracic segment .32 mm. Width at anal segment .28 mm.

*Second Instar.*—Head smooth, shining, pale red brown, .60 mm. in width; ocellar field black.

Whole body bristling with numerous straight sharp spiculiferous hairs, arising from narrow red brown tubercles, .02 mm. in height, or less for the smaller hairs. These hairs varying in size, the longest .30 mm. in length, the shortest .06 mm. They are nearly all reddish brown tinged, only a few being colorless. Spiracles obovate, .02 mm. in diameter, with a fine brown ring. Dorsal shield pale brown, subtriangular.

Body now green, irregularly mottled with blotchings of reddish brown, but as the stage proceeds these blotchings fade into deep green. Substigmatally, the green coloration is replaced by a more vivid yellow green, to the naked eye appearing as a fairly well defined stripe, and becoming more and more yellowish, with less green, as the instar advances. Prolegs and ventral surface pale gray green; legs very pale reddish brown, subhyaline.

Length 2.60 mm. Width at first thoracic segment .65 mm. Width at second thoracic .80 mm. Width at anal segment .54 mm.

*Third Instar.*—Head smooth, shining, pale brown, .88 mm. in width; ocellar field black.

Whole body, as in previous stage, bristling with numerous straight sharp spiculiferous hairs, arising from red brown tubercles. The hairs averaging .28 mm. in length, mostly reddish brown tinged, only a few being colorless. Spiracles obovate, .035 mm. in diameter, with a fine brown ring. Dorsal shield pale brown, subtriangular.

Body in color deep green. The infrastigmatal yellow band more strongly developed, increasingly so as the stage develops. Prolegs and ventral surface a pale gray green; legs subhyaline pale reddish brown.

Length 3.40 mm. Width at first thoracic .90 mm. Width at anal segment .80 mm.

*Fourth Instar.*—Head smooth, shining, pale brown, 1.20 mm. in width; ocellar field black; frontal triangle and mouth parts fuscous.

Whole body as before, bristling with numerous sharp, straight, spiculiferous hairs, varying in size, some as short as .08 mm., others up to .35 mm., and arising from narrow red brown tubercles. Hairs prominently reddish brown tinged, quite heavily infuscated at tips, a few hairs colorless. Spiracles obovate, .045 mm. in diameter, with a fine brown ring. Dorsal shield pale brown, subtriangular.

Body in color deep green, laterally with irregular blotchings of a still deeper green. The crenate infrastigmatal yellow band conspicuous, and increasing in prominence as the instar proceeds. The dorsal ridge bordered on either side with a line of green-yellow, not as prominent as the infrastigmatal stripe. Ventral surface and prolegs bluish green; legs very pale reddish brown, subhyaline.

Length 4.20 mm. Width at first thoracic segment 1.30 mm. Width at anal segment 1.15 mm.

*Fifth Instar.*—Body largest anteriorly, tapering only slightly posteriorly, but rapidly on final two abdominal segments. Anal segment well rounded and at extreme tip subtruncate. Body rather strongly hunched, falling off abruptly at posterior margin, with three median depressions: a dorsal, very slight; one lateral, more distinct; the third much deeper and connecting with the one above so as to form a C, open anteriorly, and in the deepest part of which the spiracles are situated. On second thoracic the two upper depressions run together into a transverse sulcus.

Head smooth, shining, pale brown, 1.40 mm. in diameter; ocellar field black; frontal triangle and mouth parts fuscous.

As before, whole body bristling with numerous straight, sharp, spiculiferous hairs, arising from rather high but narrow tubercles, averaging .04 mm. in height with the issuing hairs varying in size, from .12 to .40 mm. in length. For the most part the hairs are strongly tinged with reddish brown, only a few, and these usually the shorter ones, being colorless. Spiracles broadly obovate, pallid, with a fine brown ring, .08 mm. in diameter. Dorsal shield of first thoracic rather deep, pale brown, lozenge-shaped with emarginate sides.

Body in color dark velvety green, considerably deeper green than the sprigs of Juniper. The yellow sublateral dashes conspicuous, slightly oblique, more or less tinged with green; the

dashes sublunate, largest anteriorly, on first thoracic more or less obscure. The infrastigmatal band also composed of yellow dashes, but here straighter and slenderer, and forming more of a continuous band. But as the instar goes on, both of these series of dashes change from yellow to white. Half way between, on posterior edge of segments, a short, straight, greenish white bar, not at all conspicuous. Ventral surface and prolegs concolorous with above; legs pellucid yellow green basally, fuscous tipped.

Length 11. mm.; at maturity 14.50 mm. Width at first thoracic segment 3.10 mm. Width at anal segment 2.60 mm.

*Chrysalis.*—Viewed from above: Thorax shorter and considerably narrower than abdomen, scarcely narrowing at junction to abdomen; narrowing considerably anteriorly, well arched, head prominence not sharply breaking regularity of curve, basal wing tubercles weak. Abdomen regularly curved, broadly rounded at the posterior segment.

Viewed laterally: Abdomen considerably higher than highest point of thorax. The junction between the thorax and abdomen indicated by a well-rounded hollowing. Thorax most prominent just back of middle of mesothorax, curving thence forward and downward rapidly. Abdomen roundly arched, highest at third and fourth segments. Posterior abdominal segments sloping a little more rapidly than thoracic segments, the last abdominal segment posteriorly being perpendicular. Ventrally flattened.

Whole body marked with an interlacing net-work of raised lines, not disposed in any regularity of pattern, and with the points at the intersections sometimes slightly raised so as to form minute naked warts. These raised lines slightly darker than ground color, low and equal, forming rather large cells, which are profusely sprinkled with minute ovate punctulations. Another series of larger warts, in the cells formed by the raised lines, or on the lines themselves, rather profusely and irregularly scattered, .02 mm. in diameter and concolorous with body. These larger warts give rise to short, sharp, spiculiferous hairs, generally very straight, only a few slightly curving, varying in size, some as long as .20 mm., others but .10 mm. The hairs dark brown in color. Spiracles long oval, luteous, white lipped, 1.4 mm. in length.

Color a rich wood brown, the abdomen blotched somewhat with ferruginous, but not conspicuously so. Length 8.50 mm. Greatest width of abdomen 4.30 mm. Greatest width of thorax 3.20 mm. Greatest height of abdomen 4. mm. Greatest height of thorax 3. mm.

# Preliminary Note upon the Pseudoscorpions as a Venomous Order of the Arachnida.

By JOSEPH CONRAD CHAMBERLIN, Stanford University, California.

Recently in the course of my studies upon the morphology of the Pseudoscorpions, I discovered what appear to be, with little doubt, the poison ducts of these animals and the point of their debouchement.

This discovery is of particular interest, inasmuch as they have heretofore been generally regarded as a non-venomous order of the Arachnida. Support of this view was largely of a negative character. They do not possess the caudal poison sting of the true scorpions and those glands which are almost surely the homologues of the poison glands of the spiders, are here modified into silk-secreting organs. These facts coupled with their small size and consequent inability to inflict spectacular injuries have largely contributed to this belief. Since the galea would eliminate the possibility of the silk secretion serving also as a venom (in most of the species at least), there remain but two effective ways in which they could function as venomous organisms.

In the first place we have the possibility of the saliva or some saliva-like secretion serving this purpose. This is rendered improbable, however, when we consider that the powerful pedipalpi typically reduce the prey to helplessness before it is even brought near the oral apparatus.

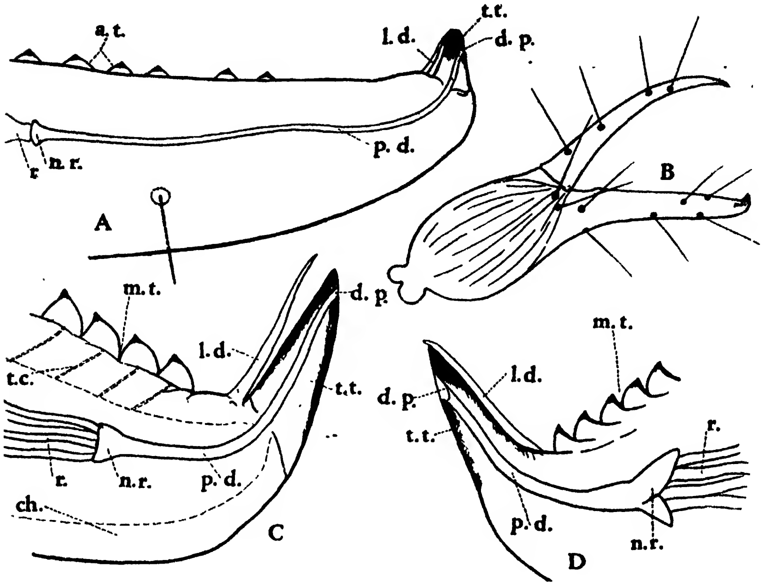
Then, as a final hypothesis, there is the possibility that the poison apparatus is situated at the tips of the fingers of the powerful chelate pedipalpi.

Consequently it is of more than ordinary interest to be able to report positive evidence of ducts debouching just at the point postulated by this third hypothesis.

A detailed description is unnecessary, the accompanying figures being self-explanatory. There are a number of points common to all types observed and these may be briefly noted.

The poison duct itself consists of a slender tube of variable length which debouches by means of a small pore situated on the outer curve of the terminal tooth of the finger, and just pos-

terior to its apex. Its posterior termination is a bulbous enlargement the *nodus ramosus,* from which posteriorly depart from one to four or five slender tubes, the *ramulus* or *ramuli.*




A—*Chelanops macrochelatus,* Tip of movable finger showing the poison apparatus of the Cheliferine type.

B—*Obisium carolinensis,* Lateral aspect of hand of pedipalpus showing diagrammatically the extent of the musculature and the arrangement of the tactile setae. Also the relative size and position of the poison ducts.

C—*Obisium carolinensis,* Tip of fixed finger showing the poison apparatus of the Obisiine type.

D—*Ideobisium* sp., Tip of fixed finger. Note peculiar modification of nodus ramosus.

Abbreviations: m. t.—marginal teeth; a. t.—accessory teeth; p. d.—poison duct; n. r.—nodus ramosus; r.—ramulus or ramuli; t. t.—terminal tooth; d. p.—debouchement of poison duct; l. d.—lamina defensor of terminal tooth; ch.—chitin; t. c.—"tooth canal," running to base of marginal tooth through chitin of finger.

These ramuli probably immediately enter, and are surrounded by glandular tissue, although this latter point is not certain. As shown in fig. B, the musculature leaves sufficient space for such tissue even allowing for the ectoderm and the considerable amount of nervous tissue necessary to supply the long tactile setæ and sense spots of the figures. An interesting structure is

found just posterior of the terminal tooth, which may possess some function in connection with the poison apparatus. This structure, which is here designated the *lamina defensor,* consists of a slender, translucent, blade-shaped process, usually a trifle longer than the terminal tooth and often closely appressed thereto.

The demonstration of the above described structures is very simple. Material which has been killed in alcohol and subsequently cleared in carbol-xylene shows them perfectly, without dissection of any sort.

They are definitely present in the Cheliferinæ and the Obisiidæ. My investigations are not complete but apparently they are absent in the Cheiridiinæ, the Garypidæ, the Feællidæ and the Chthoniidæ.

In the Obisiidæ (Figs. B, C & D) the poison duct is very short, the nodus ramosus being close to the terminal tooth, and the poison ducts occur only in the fixed finger of each hand. In the Cheliferinæ (Fig. A) the poison duct is elongate and the nodus ramosus is situated far from the posterior tooth, while the ducts occur in all four fingers.

There is no doubt about the presence of these ducts and, as a corollary, of the glands. The poisonous nature of their secretion then is the only questionable point and there are in the literature statements giving strong circumstantial evidence of its positive venomous character.

In the first place we have the observations of Bachausen. I quote verbatim the summary of these observations as given by Berger, 1905, pp. 412-413.

"Thus Prof. C. Berg reports that Bachausen in South America found a pseudoscorpion attached to the leg of a blow-fly and hanging free. He noticed after several hours that the legs of the fly became stiff. The next morning the fly was dead and the 'scorpion' sucked full under some scraps of paper. Bachausen next hungered a number upon moss under a glass and then gave them some small flies. The pseudoscorpions soon appeared and began to attach themselves to the legs of the flies by one pedipalp. . . . . The legs of the flies soon became stiffened and when the flies died they dragged them into concealment. A tabanus is reported as dying much slower than the other flies. On the other hand, Muhlhausen does not find that

the fly's leg was stiffened by a *Chelifer cancroides,* which held fast for fifty-six hours or until it was drowned in a drop of milk. Nor did the microscope show any evidence of injury to the fly's leg. It occurs to me, however, that *C. cancroides* is one of the smaller species and consequently was not able to injure the fly's leg as an individual of a larger species could have done."

As to the exception reported by Muhlhausen, *Chelifer cancroides* does possess the poison apparatus here described and I can only reiterate Berger's comment, that it was probably due to the fact that the animal was unable to penetrate the hard chitin of the fly's leg. This also shows that the tiring effect of the pseudoscorpion upon the fly is not sufficient to explain the early death of the flies reported by Bachausen. Certainly the poisoning effect seems to be a slow one, but nevertheless truly existent. It is impossible to imagine a mere mechanical injury to a fly's leg causing its death in a few hours.

A second bit of evidence as to their truly venomous nature is given to us by Emile André, one of the few observers to state a positive belief in the poisonous nature of these animals. In 1908 he reported the case of a woman of Geneva who was bitten three times by a specimen of *Chelifer cancroides,* twice on the thigh and once on the back. The animal itself was captured in this latter situation. The bite caused a sharp, though slight, transient pain. Later the injured spot gave rise to a small, bluish, red-centered swelling which was painful upon pressure and at a higher temperature than the surrounding skin. He adds that the patient had immediately bathed the injured part with "une solution de sublimé au millieme" and that it was possible that this had aggravated in some measure, the original injury. The first bites caused more severe pain than the last, probably on account of the diminished quantity of "saliva or venom" introduced into the wound.

The following paragraph is a free translation of his conclusions.

"Nevertheless it seems probable by reason of the above related facts, that a quantity of venom or saliva had been introduced into the little wound and for this reason we suppose that the cheliceræ performed the function and not the palpi,

which as is generally known, do not possess a venomous apparatus. Furthermore it is probable that the cheliceræ entered simultaneously and pinched the victim's skin."

While it is not impossible that some groups of the Pseudoscorpions (the non-galeate forms) could inflict a poisonous wound with the cheliceræ, assuming the secretion of the silk glands to possess toxic properties in addition to their primary qualities, it would be impossible in those groups possessing cheliceræ with a specialized spinneret or galea. In this connection it is interesting to note that the Chthoniidæ lack the galea and also the palpal poison apparatus and hence might well be studied with this possibility in mind. On the other hand the Obisiidæ which also lack the galea, possess the palpal poison apparatus in a well developed form. *Chelifer cancroides* being a galeate form is incapable of inflicting a poisonous injury with the cheliceræ and hence André's suggestion must be ruled out, the more so, since we now know that the pedipalpi in this form *do* possess the means of inflicting the venomous wound.

In view of the above presented evidence it seems fairly certain that:

The Pseudoscorpions may or may not, depending upon the group, possess a well developed poison apparatus situated in two or all of the fingers of the pedipalpi, again depending upon the group under consideration. This conclusion is supported by definite and positive physiological evidence of a circumstantial nature. The situation and character of this poison apparatus is, so far as known, unique among the Arachnida and serves to further accentuate the isolated position already held by this order.

*List of papers cited in the text* and some others having a bearing on the venomous nature of the pseudoscorpions. I have not examined those marked with an asterisk.

1893—BERG, C. Pseudoscorpioniden kniffe. Zool. Anz. Bd. 16.

*1894—MUHLHAUSEN, HESS. Ueber Pseudoscorpioniden als Ræuber. Zool. Anz. Bd. 17.

1905—BERGER, E. W. Habits and Distribution of the Pseudoscorpionidæ, etc. (Cites Berg and Muhlhausen), Ohio Naturalist. Vol. 6; pp. 412-413.

1908—ANDRE, EMILE. Sur la piqure des Cheliferes. Zool. Anz. Bd. 33, pp. 289-290.

*1909—ANDRE, EMILE. Les Faux Scorpions et leur morsure. Geneve Bul. Inst. Nat. pp. 277-280.

# The Muscoid Genus Genea in North America (Dipt.).

By J. M. Aldrich, United States National Museum,
Washington, D. C.

Rondani established the genus *Genea* in 1850 (Nuov. An. Sci. Nat. Bologna, ser. iii, vol. ii, p. 172), with the type and sole species *maculiventris,* new, from Venezuela. He dedicated it to "my very dear friend and master lately deceased, Professor Joseph Gené." The accent should be on the second syllable, and it might well have been spelled Genaea to bring this out. Rondani's description is masterly and sufficient, and, on account of its inaccessibility, I translate it entire from the Latin.

"Genus **GENEA** mihi.

Third and fourth veins of the wing reaching the costa separately, the fourth curved, not angulate, and thence arcuate outwardly; hind crossvein more distant from the anterior one than from the bend of fourth. Antennae of ordinary length, reaching almost to the epistoma, inserted on the front well above the middle of the eyes, the third joint three times the second. Arista a little tomentose or with very short pilosity, the second joint short but distinct. Eyes bare. Frontal bristles not continuing upon the face. Proboscis filiform, quite elongated. Palpi cylindrical and long, reaching to the middle of the proboscis and distinctly beyond the epistoma. Abdomen with only marginal macrochaetae, not provided with forceps or large and stout appendages nor curved under. See figures 4-5. Related to *Myobia* and *Fischeria*.

"Species **Genea maculiventris** mihi, Patria Venezuela. Length: 7 mm.

Male. First two antennal joints and base of third fulvescent, remainder of the third black. Arista very briefly pilose, black. Face a little whitish-sericeous. Front fulvescent, the bristles in two rows. Facial ridges with hardly a single bristle above the vibrissae; some bristles around the peristome; frontals hardly produced below the root of the antennae. Palpi and proboscis pale at base, the latter blackish apically, the former with small black hairs above and below. Thorax lutescent, middle of the dorsum black, pleura with a small blackish spot and others on pectus, metathorax blackish in middle. Scutellum lutescent. Abdomen lutescent, the second segment above with a triangular black spot behind, and a black dot at either side on the hind edge; third segment with a median black vitta dilated behind

and a small black spot on the hind edge at each side; fourth segment with two small lateral black spots behind. First abdominal segment without macrochaetae, second with two marginals, third and fourth with several marginals. Legs lutescent, tarsi black. Wings subhyaline; first longitudinal vein wholly setulose above, third setulose to the small crossvein."

The National Museum has a Brazilian specimen, female, one of the old H. H. Smith collection that was purchased by Dr. Williston and afterwards secured by the American Museum of Natural History, from which Townsend obtained it. The exact locality is "Piedro B."* It agrees perfectly with the description, and is very close to *texensis* Townsend. The black spots of the abdomen are smaller in all of our North American specimens except the one from Mexico, identified as *longipalpis* Van der Wulp, and we have none with the proboscis quite so elongated and slender, though the difference in this is not great. On the whole, after much consideration, I think it best to regard *texensis* and *longipalpis* as distinct species for the present, but further material may enable us to unite them with *maculiventris*.

In the table of Coquillett's Revision, *Genea* runs readily to *Leskiomima*, from which it separates by having long palpi; unless the proboscis is greatly retracted, the palpi project far beyond the epistoma in a very characteristic manner. Both *Leskiomima* and *Genea* have elongate form, yellow color, first vein hairy, arista pubescent, ocellar bristles small to minute and identical chaetotaxy. *Leskiomima* has but one described species, *tenera*. In this the male has long claws and pulvilli, and has no orbitals.

*Genea* has perhaps four species, but two may be synonyms. Besides the type species already noted these are the following:

**Genea analis** Say.

*Dexia analis* Say, Jour. Acad. Nat. Sci. Phil., vi, 1829, 177; Comp. Works, ii, 367.

*Leskiomima tenera* Wiedemann (in part), Coquillett, Revis. Tachin., 1897, 67 (the specimen from Chester Co., Pa.).

---

[* Possibly Piedra Blanca, Bolivia, four miles west of Corumbá, Brazil. H. H. Smith, quoted in Ann. Carnegie Museum, Pittsburgh, vi, p. 77. 1909.—Ed.]

Say's description being readily accessible, I will merely state that his specimen was a yellow fly 8.75 mm. long, evidently with the arista at least pubescent or he would not have called it *Dexia,* and he adds the important note, "The proboscis and palpi are much elongated."

Coquillet misidentified the species in his Revision and made it out the same as his own *Myobia depile,* there referred to the genus *Leskia,* while he placed a female belonging to *analis* in his lot of *Leskiomima tenera,* along with two specimens of the species later described as *texensis. Analis* in this mistaken sense was split up by Townsend into *Myobiopsis similis* and *Leskiopalpus calidus* (Proc. U. S. N. M., vol. 49, 1916, 628, 629); the latter of these is a synonym of *depile* Coquillett, as pointed out by Smith in Proc. Ent. Soc. Wash., xix, 1917, 125. All this, however, has nothing to do with the true *analis* as I make it out.

The National Museum contains the following material assigned by me to this species:

One male, Chain Bridge, Virginia, VIII, 3, 1923 (Aldrich); one female, same place and collector, VI, 25, 1923; one female, Great Falls, Virginia; IX, 20, 1917 (C. T. Greene); one female, Plummer's Island, Maryland, IX, 29, 1912 (P. R. Myers); one female, same, VIII, 5, 1914 (Shannon); one female, same, VIII, 18, 1912 (Malloch); one female, Chain Bridge, Virginia, on *Ceanothus,* VI, 23, 1916 (Greene); one female, Chester County, Pennsylvania, VIII, 25, 1895 (C. W. Johnson); and one female, Lafayette, Indiana, IX, 9, 1916 (Aldrich).

The differences between this and *texensis* are discussed below.

**Genea texensis** Townsend.

*Dejeaniopalpus texensis* Townsend, Proc. U. S. N. M., Vol. 51, 1916, 312.

*Leskiomima tenera* Wiedemann (in part), Coquillett, Revis. Tachin., 1897, 67 (the two specimens from New York City).

Townsend described the species from a single female labeled "Tex.," failing to observe two more specimens among Coquillett's set of *Leskiomima tenera.* The following material assigned by me to this species is in the National Museum:

One male, Virginia across the river from Washington, bred

by Pergande (No. 3661) from a Lepidopterous larva sp. (*Botys* sp.) which "curiously rolls up the terminal leaves of a fern into a perfect ball," VII, 3, 1885; one female, Texas, type of the species; two females, New York City, VIII, 8, 1890 (E. B. Southwick); one female, Pocono Lake, Pennsylvania, VII, 11, 1911 (Greene, in the Walton coll.); and one female, Ithaca, New York (Banks).

It will be observed that we have a single male of *analis* and the same of *texensis*. The capture of the male of *analis*, on Aug. 3, 1923, absolutely ruined the first draft of the present paper, which was committed to a single North American species of *Genea*, at least in the United States. This male proved conclusively that the material must be distributed between two species, a fact which could not be established from females alone.

The two males differ in the following characters:

That of *analis* is larger (8.75 mm., exactly as given by Say); its front is .23 of the headwidth by micrometer, and has no orbitals; the claws and pulvilli are long on all the tarsi; the width of the third antennal joint is 5 and the length 15 by micrometer.

The male of *texensis* is smaller (6.5 mm.); the front is .30 of the headwidth, and has two pairs of orbitals; the claws and pulvilli are all small; the width of the third antennal joint is 6 and the length 13 by micrometer.

I can make out no other differences of any significance at all. The ones noted are sexual characters and would not show in the female, except size and the shape of the third antennal joint. Size of course is variable and may mislead; the three females first mentioned under *analis* are large like the male, all the rest smaller and agreeing in this respect with *texensis*. I have depended most on the shape of the third antennal joint for placing the females; some agree with the respective males so as to leave little doubt of their relations, but several are intermediate and I am not quite sure to which they belong.

Rondani's statement that the frontals are in two rows in his male shows that orbitals were present, and his species is more nearly related to *texensis* than to *analis*.

**Genea longipalpis** Van der Wulp.

*Myobia longipalpis* Van der Wulp, Biologia, Dipt., II, 1890, 138.

A female identified as this by Townsend is in the National Museum. He placed it naturally under his *Dejeaniopalpus*. It is from San Rafael, Vera Cruz, Mexico, Mar. 8 (Townsend). It has a slightly shorter proboscis than our female of *maculiventris*, but is probably the same species. It seems prudent to see the male before definitely dropping the name into synonymy. Both of these specimens have a large, triangular median black spot on both second and third segment, the apex of the spot reaching to the front edge of the segment.

Obviously the genus *Dejeaniopalpus*, type *texensis*, is a synonym of *Genea*.

Brauer and Bergenstamm seem to be in error (Zweifl. Kais. Mus., VI, 1893, 132) in making *Spathipalpus* Rondani (type *philippii* Rondani from Chile), a synonym of *Genea*. The Chilean species has the frontals extending upon the face, according to the description, and the palpi are spatulate. It is a black species, and may be a Dejeaniine with hairy first vein.

## On the Identity of the Genus Ernestia R. D. (Tachinidae, Dipt.).*

By C. Howard Curran, Ottawa, Ontario.

In his "Revision of the Nearctic Species of the Tachinid Genus *Ernestia* R. D." (Can. Ent., Sept. 1921, p. 199 etc.), Dr. J. D. Tothill pointed out certain characters separating the various groups which he included under this genus. The chief characters of the subgenus *Meriana*, as outlined by him in the revision, were the absence of discal macrochaetae on the second abdominal segment and hairy parafacials. Neither of these characters can be regarded as of generic value in most cases, and they were not so considered by Tothill. Perhaps the most significant statement, from a generic standpoint, is the indication

* Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

of primitive posterior (inner of Tothill) claspers, as these possess no "keel" in *Meriana*. The type species of *Ernestia* (*E. rudis* Fallen) has the same type of genitalia, while the majority of the species enumerated by Tothill have the posterior claspers more or less strongly keel-shaped.

A study of species treated by Tothill proves that there are two very easily separated genera which may be distinguished as follows:

The genus *Ernestia ss.* is devoid of a group of fine hairs on the metanotal slopes immediately below the inner base of the squamae, and the posterior forceps are normally simple.

The genus *Mericia* R. D. (the species not included above) possess a group of fine hairs on the metanotal slopes immediately below the inner base of the squamae; posterior genital forceps usually carinate.

It is quite evident that the species placed in the sub-genus *Meriana* really belong to the genus *Ernestia*, while practically all those considered under the subgenus *Ernestia* belong to the genus *Mericia* as limited above.

The genus *Ernestia* therefore includes, as far as I am acquainted with them, the following species, *rudis* Fall. (type), *radicum* Mg., *flavicornis* Br., *chalybea* Coq.? and *nigrocornea* Coq.?

*Mericia* includes those species listed by Tothill on p. 203, of the *Canadian Entomologist* for September, 1921, under the subgenus *Ernestia*.

The genus *Meriana* is therefore a synonym of *Ernestia*. *Metaphyto* is evidently not separable from *Ernestia* and should be considered a synonym. By the use of the character indicated as separating *Mericia* and *Ernestia* we are able to definitely isolate the former from other allied genera, this undoubtedly being a step in the right direction in the classification of this difficult group.

While dealing with the subject, I wish to point out that the genus *Bombyliomyia* has the lower squamae long pilose above, a character I have not noted in other genera.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JUNE, 1924.

## The Ages of Some Existing Entomological Journals.

A writer in the business and financial section of *The Public Ledger* (Philadelphia) for April 19, 1924, said:

Fifty years is a variable quantity. It is the major part of a man's life, an era for a nation, a passing moment in geology. For a magazine it is a ripe and venerable age. Few technical journals have reached it. Engineering News-Record reached that age this week.

This remark reminded us that the present year is witnessing the fiftieth volume of the *Transactions of the American Entomological Society*. The American Entomological Society is the metamorphosed Entomological Society of Philadelphia, organized February 22, 1859, incorporated in April, 1862, the name changed in February, 1867. Under its original name, the Society published six volumes of the *Proceedings of the Entomological Society of Philadelphia* from 1861 to 1867. With the change in its title, the first volume of the *Transactions* was begun in June, 1867, so that with the fiftieth volume appearing in 1924, the number of volumes is seven less than the number of years (57) during which the series has been appearing, a correspondence of years with volumes not obtaining in the earlier years. One member of the original Publication Committee of 1861 is still a member of that committee to-day—the founder of the Society, the veteran hymenopterologist, Ezra Townsend Cresson.

The *Proceedings-Transactions* is the oldest existing purely entomological journal in the Americas to-day. Next in chronological order come The Canadian Entomologist, 56 volumes, begun in 1868; the 53 Annual Reports of the Entomological Society of Ontario (the first in 1871); Psyche, 31 volumes, begun in 1874; Bulletin of the Brooklyn Entomological Society, 19 volumes, 1878-1885, 1912 on; Proceedings of the Entomological Society of Washington, 26 volumes, begun in 1884; Journal of the New York Entomological Society, 32 volumes, begun in 1893; Journal of Economic Entomology and Annals of the Entomological Society of America, each 17 volumes, both begun in 1908.

It may be of interest to contrast these with the dates of commencement of the older, existing, or recently existing, European entomological journals, as given by Mr. Banks, in Bulletin 81 of the Bureau of Entomology, U. S. Dept. of Agriculture (1910), but here arranged chronologically:

1832. Annales, Société Entomologique de France, Paris.
1835. Transactions, Entomological Society of London.
1840. Entomologische Zeitung, Stettin.
1857. Berliner Entomologische Zeitung.
1858. Tijdschrift voor Entomologie, The Hague.
1860. Annales, Société Entomologique de Belgique, Brussels.
1861. Horae Societatis Entomologicae Rossicae, Petrograd.
1864. Entomologists' Monthly Magazine, London.
1864. The Entomologist, London.
1865. Mitteilungen der schweizerischen entomologischen Gesellschaft, Berne.
1869. Bolletino della Societá Entomologica Italiana, Florence.
1880. Entomologisk Tijdskrift, Stockholm.
1881. Deutsche Entomologische Zeitschrift, Berlin.
1882. Revue d'Entomologie, Caen.
1882. Wiener Entomologische Zeitung.

## The Occurrence of an Important European Parasite in North America (Hymen.: Elachertidae).

While attempting to follow the life history of the spotted cut-worm (*Agrotis c-nigrum* L.) on the cranberry, the writer encountered several parasitic insects. Specimens of some hymenopterous parasites were sent to Dr. L. O. Howard for identification, and were turned over by him to Mr. A. B. Gahan. Mr. Gahan's final determination brought to light the first record of *Euplectrus bicolor* Swederus (Elachertidae) in this country. The specimens were reared by the writer from a loose, matted mass of silken filaments surrounding a dead larva of *Agrotis c-nigrum*. The larva and the cocoon-like structure were found on a cranberry bog which was heavily infested with spotted cut-worm larvae in the town of Kingston, Massachusetts, during the latter part of July, 1923. The adults emerged July 26, 1923. Dr. Howard states that this is an important parasite of cut-worms in France and Italy, and that no record of its appearance in North America has heretofore been established.—Don S. Lacroix, Amherst, Massachusetts.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

1—Proceedings of the Academy of Natural Sciences of Philadelphia. 7—Annals of the Entomological Society of America, Columbus, Ohio. 10—Proceedings of the Entomological Society of Washington, D. C. **14**—Proceedings of the Zoological Society of London. **20**—Bulletin de la Societe Entomologique de France, Paris. **22**—Bulletin of Entomological Research, London. **24**—Annales de la Societe Entomologique de France, Paris. **36**—Transactions of the Entomological Society of London. **41**—Bulletin de la Societe Entomologique Suisse, Bern. **61**—Proceedings of the California Academy of Sciences, San Francisco. **64**—Parasitology, London. **68**—Science, Garrison on the Hudson, N. Y. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **82**—The Ohio Journal of Science, Columbus. **89**—Zoologische Jahrbucher Jena. **95**—Annales des Sciences Naturelles, Zoologie, Paris. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **114**—Entomologische Rundschau, Stuttgart. **115**—Societas Entomologica, Stuttgart. **138**—American Museum Novitates, New York. **141**—Internationale Entomologische Zeitschrift, Guben. **143**—Stettiner Entomologische Zeitung.

**GENERAL. Arnold, J.**—Grau ist alle theorie. **141**, xviii, 11-12. **Binder, und Haase.**—Vom sammler zum lokalfaunisten. **141**, xviii, 2-3. **Cornetz, V.**—Les insectes paralyseurs (La Nature, Paris, 1924, 252-54). **Sherborn, C. D.**—Index animalium, Sec. 2, Pts., II-III, Aff-Bail. **Weiss, H. B.**—Insect food habits and vegetation. **82**, xxiv, 100-6.

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC. Cleveland, L. R.**—The physiological and symbiotic relationships between the intestinal protozoa of termites and their host. . . **100**, xlvi, 203-27. **Feuerborn, H. J.**—Der dipterenflugel nicht meso—, sondern metathoracal? Eine neue morphogenetische deutung des dipterenthorax. **89**, xlii, Anat., 529-46. **Gadeau de Kerville, H.**—Consequences de la ligature de la tete, avec ou sans decapitation, chez les vers a soie du murier (Sericaria mori) au moment de la nymphose. **20**, 1924, 69-70. **de Gedroyc, M.**—L'influence de lymphe des insectes sur le microbe de la race. **77**, XC, 906-7. **Noskiewicz et Poluszynski**—Un nouveau cas de polyembryonie chez les insectes (Strepsipteres). **77**, xc, 896-8. **Uichanco, L. B.**—Studies on the embryogeny and postnatal development of the Aphididae with special reference to the history of "symbiotic organ" or "mycetom" (Phil. Jour. Sci., xxiv, 143-247). **Zawarzin, A.**—Ueber die histologische beschaffenheit des unpaaren ventralen nervus der insekten. **104**, cxxii, 97-115.

**ARACHNIDA AND MYRIOPODA. *Chamberlain, R. V.**—The spider fauna of the shores and islands of the Gulf of California. **61**, xii, 561-694. **Hirst, S.**—On some new or little-known species of Acari. **14**, 1923, 971-1000.

**THE SMALLER ORDERS OF INSECTA. Krafka, J.** —Morphology of the prolegs of trichopterous larvae. **7**, xvii, 97-105. **Mosely, M. E.** — Scent organs in the genus Hydroptila (Trichoptera). **36**, 1923, 291-4. **Philpott, A.**— (See under Lepidoptera). **Vogel R.**—Zur kenntnis des baues und der funktion des stachels und des vorderdarmes der kleiderlaus (Pediculus vestimenti). **89**, xlii, Anat., 229-58.

***Folsom, J. W.**—New sps. of Collembola from New York State. **138**, No. 108.

**ORTHOPTERA. Bugnion, E.**—Mantes et Empuses. Essais d'elevarage appareil de la femelle. Confection de l'ootheque. Eclosion des jeunes larves. (Mem. Soc. Vaud. Sci. Nat., 1923, 177-243.) **Plotnikov, V. I.**—Some observations on the variability of Locusta migratoria, in breeding experiments. **22**, xiv, 241-3.

**HEMIPTERA. Holland, W. J.** — The family name of the lace-bugs (Tingitidae). **7**, xvii, 95-6.

***Bergroth, E.**—On the Isometopidae of No. Am. **143**, iv. 3-9. **Bruner, S. C.**—Una nueva especie de la familia Enico-

cephalidae. (Mem. Soc. Cubana Hist. Nat. F. Poey, vi, 53-9.) ***Gillette & Palmer**—New Colorado Lachnini. **7,** xvii, 1-58. ***McAtee, W. L.**—Notes on the genus Dikraneura in the U. S. (Eupterygidae). **10,** xxvi, 75-6. **Silvestri, F.**—Descripcion de un nuevo genero y tres especies nuevas de Ortheziinae de Espana y de Costa Rica. (Coccidae.) (Bul. R. Soc. Espanola Hist. Nat., xxiv, 169-76.)

**LEPIDOPTERA. Eltringham, H.**—On the tympanic organ in Chrysiridia ripheus. **36,** 1923, 443-58. **Hock, K.**—Ueber aberrationen bei schmetterlingen. **114,** xli, 13-4. **Ishimori, N.**—Distribution of the malpighian vessels in the rectum of lepidopterous larvae. **7,** xvii, 75-86. **Philpott, A.**—The genitalia in Sabatinca and allied genera with some observations on the same structures in the Mecoptera. **36,** 1923, 347-66. **Rangnow, H.** — Beitrage zur symbiose zwischen Lycaeniden und Ameisen. **141,** xviii, 10-11.

**Clark B. P.**—Twelve new Sphingidae. (Proc. N. Engl. Zool. Club, ix, 11-21.) **Ford, E. B.**—The geographical races of Heodes phlaeas. **36,** 1923, 692-743. **Oberthur, C.**—Le genre Agrias. (Etud. Lep. Comp. Fasc. xxii, 11-84.) **Skinner & Ramsden**—Annotated list of the Hesperiidae of Cuba. **1,** lxxv, 307-21,

**DIPTERA. Frew, J. G. H.**—On the larval anatomy of the gout-fly of barley (Chlorops taeniopus) and two related muscids, with notes on their winter host-plants. **14,** 1923, 783-822. **Keilin, D.**—On the life history of Anthomyia procellaris, and A. pluvialis, inhabiting the nests of birds. **64,** xvi, 150-9. **Mercier, L.**—Malformations produites chez une mouche (Calliphora erythrocephala) par l'action des vapeurs de naphtaline; reapparition des anomalies dans une seconde generation elevee dans des conditions normales. **69,** clxxviii, 1326-9. **Saunders, L. G.**—On the life history and the anatomy of the early stages of Forcipomyia (Ceratopogoninae). **64,** xvi, 164-213. **Verhein, A.**—Die eibildung der Musciden. **89,** xlii, Anat., 149-212. **Vogel, R.**—Kritische und organzende mitteilungen zur anatomie des stechapparats der Culiciden und Tabaniden. **89,** xlii, Anat., 259-81.

**Borgmeier, T.**—Drei neue Phoriden aus Brasilien. **115,** 13-15. **Malloch, J. R.** — A new species of Conicera from Porto Rico (Phoridae). A new gen. and sp. of Muscidae. **10,** xxvi, 73; 74. ***Spuler, A.**—North American genera and

subgenera of dipterous family Borboridae. **1**, lxxv, 369-78. ***Spuler, A.**—Species of subgenera Collinella and Leptocera of N. Am. **7**, xvii, 106-17.

**COLEOPTERA. Bertrand, H.**—Eclosion de l'oeuf de quelques Chrysomelides. **20**, 1924, 54-7. **Bertrand, H.**—Larve et nymphe d'Haliplus lineaticollis. Anomalies chez des larves et nymphes de coleopteres. **24**, xcii, 323-38; 339-44. **Scott, H. M.**—Observations on the habits and life history of Gallerucella nymphaeae. (Tr. Am. Micro. Soc., xliii, 11-16.) **Van Vleck, H.**—The flashing of fireflies. **68**, lix, 379.

**Horn, W.**—Zur systematik, geographic, und lebensweise der Cicindelinae. **89**, xlviii, Syst., 309-30. ***Mann, W. M.**—Myrmecophiles from the western U. S. and Lower California. **7**, xvii, 87-95. **Maulik, S.**—A new hispid beetle injurious to oil palms in Brazil. **22**, xiv, 245-6. **Mutchler, A. J.**—A new sp. of Cicindelidae from Cuba. **138**, No. 106. **Reichensperger, A.**—Neue sudamerikanische Histeriden als gaste von wanderameisen und termiten. **41**, xiii, 313-36.

**HYMENOPTERA. Barbey et Ferriere**—Un cas interessante de parasitologie dans l'ecorce du pin sylvestre. (Bul. Soc. Vaud. Sci. Nat., lv, 77-81.) **Bugnion, E.**—Les organes buccaux de la scolie (Scolia bifasciata). **41**, xiii, 285-313. **Peacock, A. D.**—On the males and an intersex-like specimen of the parthenogenetic saw-fly, Pristiphora pallipes. (Brit. Jour. Exper. Biol., i, 391-412.) **Pham-tu-thien**—Sur le regime alimentaire d'une espece de fourmis indochinoises (Pheidologeton diversus). **95**, vii, 131-35. **Santschi, F.**—L'orientation siderale des fourmis, . . . (Mem. Soc. Vaud. Sci. Nat., 1923, 137-75.) **Seyrig, A.**—Accouplement des ichneumons. Observations sur la biologie des ichneumons. **24**, xcii, 300; 345-62.

***Cockerell, T. D. A.**—Notes on the structure of bees. **10**, xxvi, 77-85.

---

## SPECIAL NOTICES

**Genera insectorum**, Fasc. 172, 1918, Coleoptera, Fam. Niponiidae, von H. Bickhardt. A copy of this suppressed fascicle has come to our notice. It contains 4 pp. and 1 col. plate. The family is represented by species from the oriental region only, but we think a notice of this part would be of interest.

# Doings of Societies.

## The American Entomological Society.

Meeting of October 25, 1923, Dr. Henry Skinner presidin, twelve persons present.

The Publication Committee reported papers accepted for publication by Messrs. Hebard, Blaisdell and Rehn.

The Property Committee reported the following addition to the library:

"Le Monde Social des Fourmis," by A. Forel, 3 Parts.

"The Structure and Life History of the Cockroach," by Miall & Denny.

"Les Larves et Nymphes Aquatiques des Insectes d'Europe,' by E. Rousseau.

"Pterophoridae of California and Oregon," by Lord Walsingham.

It was moved and carried that a committee of three be appointed by the President to consider the advisability of continuing the meetings of the Society through the year, conferring with the committee of the section on a similar subject.

There was discussion on the advisability of changing the time of calling the meetings from 8 o'clock to 7 or 7:30 o'clock. No action was taken, but it was to be considered again at a future meeting.

Dr. Skinner announced the death of Nathaniel C. Rothschild, speaking of his entomological career and his own personal recollections of his visit to Rothschild when in Europe. It was moved and carried that a letter of explanation be sent with his certificate of election as a Corresponding Member, to his family.

All of the nominees for Corresponding Membership of the Society, whose names were offered at the previous meeting, were unanimously elected.

LEPIDOPTERA.—Mr. Hornig stated that some cocoons of Cynthia moths, which he had collected in 1921 and had remained in a drawer, still contained live chrysalids. He also exhibited and presented to the Society prepared life histories of the southern butterfly *Calpodes ethlius* and the Florida fern caterpillar. Mr. Bayliss reported *Apatura clyton* common at Stroudsburg, Pennsylvania, about July 2, and mention was made by Dr. Skinner and Mr. Laurent of its occasional appearance in Philadelphia. Mr. Williams exhibited specimens of *Choranthus radians* and *hataiensis* and remarks were made by Dr. Skinner and Mr. Rehn on the distribution of the butterflies and other insects of the Antilles. Dr. Skinner exhibited boxes of moths of the genus

*Automeris*, many of which were collected by Mr. Huber in Nicaragua on his recent trip.

Coleoptera.—Mr. Cresson reported that *Phytonomus punctatus* F., the clover leaf beetle, was found August 30 in great numbers crawling along the curb of the Parkway, near the Academy. Were these injuring any other plant than clover? According to Smith, the beetle is full grown in May. Mr. Godine spoke of the French beetle with green and gold thorax, calling attention to the constancy in the percentage of the color varieties.

---

Annual meeting of December 10, 1923. Dr. Henry Skinner, President, in the chair, and ten members and visitors present.

Reports of the Treasurer, Publication Committee and Committee on Property were presented.

The Committee on Modification of the By-Laws reported as follows: That the meetings of the Society and of the Section be called at 7:30 P. M. instead of 8:00 P. M., and that the present agreement with the Academy be modified by striking out paragraph 5, so that a person may become a member of the Society who is not a member of the Academy.

It was moved that meetings for 1924 be held on the fourth Thursday of February, April and October and the second Monday of December.

Mr. Cresson added to the report of the Property Committee the receipt of photographs of Philip Nell and R. C. Williams, Jr., and the following additions to the cabinet: 4 paratypes *Cyrtopogon tacoma* Mel., 2 paratypes *Cyrtopogon aldrichi* Mel., 4 topotypes *Melandrea mandibulata* Ald. from A. L. Melander; 1 ♂ 1 ♀ *Panorpa nuptialis* Gers., Texas, from R. H. Painter.

Mr. Rehn moved that $50.00 be transferred from the general funds to the *Entomological News*. This motion was carried.

The following officers and committee members were nominated for 1924:

*President,* Henry Skinner; *Vice-President,* J. A. G. Rehn; *Corresponding Secretary,* Morgan Hebard; *Recording Secretary,* R. C. Williams, Jr.; *Treasurer,* E. T. Cresson; *Publication Committee,* J. A. G. Rehn, *Chairman,* E. T. Cresson, P. P. Calvert; *Finance Committee,* Morgan Hebard, *Chairman,* D. M. Castle, J. A. G. Rehn; *Property Committee,* E. T. Cresson, Jr., *Chairman,* Morgan Hebard, Philip Laurent.

In each case the nominations were closed and on motion the Secretary cast a ballot and the above Officers and Committees were elected.

R. C. Williams, Jr., *Recording Secretary.*

# Doings of Societies.

## The American Entomological Society.

Meeting of October 25, 1923, Dr. Henry Skinner presiding, twelve persons present.

The Publication Committee reported papers accepted for publication by Messrs. Hebard, Blaisdell and Rehn.

The Property Committee reported the following additions to the library:

"Le Monde Social des Fourmis," by A. Forel, 3 Parts.

"The Structure and Life History of the Cockroach," by Miall & Denny.

"Les Larves et Nymphes Aquatiques des Insectes d'Europe," by E. Rousseau.

"Pterophoridae of California and Oregon," by Lord Walsingham.

It was moved and carried that a committee of three be appointed by the President to consider the advisability of continuing the meetings of the Society through the year, conferring with the committee of the section on a similar subject.

There was discussion on the advisability of changing the time of calling the meetings from 8 o'clock to 7 or 7:30 o'clock. No action was taken, but it was to be considered again at a future meeting.

Dr. Skinner announced the death of Nathaniel C. Rothschild, speaking of his entomological career and his own personal recollections of his visit to Rothschild when in Europe. It was moved and carried that a letter of explanation be sent with his certificate of election as a Corresponding Member, to his family.

All of the nominees for Corresponding Membership of the Society, whose names were offered at the previous meeting, were unanimously elected.

LEPIDOPTERA.—Mr. Hornig stated that some cocoons of Cynthia moths, which he had collected in 1921 and had remained in a drawer, still contained live chrysalids. He also exhibited and presented to the Society prepared life histories of the southern butterfly *Calpodes ethlius* and the Florida fern caterpillar. Mr. Bayliss reported *Apatura clyton* common at Stroudsburg, Pennsylvania, about July 2, and mention was made by Dr. Skinner and Mr. Laurent of its occasional appearance in Philadelphia. Mr. Williams exhibited specimens of *Choranthus radians* and *hataiensis* and remarks were made by Dr. Skinner and Mr. Rehn on the distribution of the butterflies and other insects of the Antilles. Dr. Skinner exhibited boxes of moths of the genus

*Automeris,* many of which were collected by Mr. Huber in Nicaragua on his recent trip.

Coleoptera.—Mr. Cresson reported that *Phytonomus punctatus* F., the clover leaf beetle, was found August 30 in great numbers crawling along the curb of the Parkway, near the Academy. Were these injuring any other plant than clover? According to Smith, the beetle is full grown in May. Mr. Godine spoke of the French beetle with green and gold thorax, calling attention to the constancy in the percentage of the color varieties.

---

Annual meeting of December 10, 1923. Dr. Henry Skinner, President, in the chair, and ten members and visitors present.

Reports of the Treasurer, Publication Committee and Committee on Property were presented.

The Committee on Modification of the By-Laws reported as follows: That the meetings of the Society and of the Section be called at 7:30 P. M. instead of 8:00 P. M., and that the present agreement with the Academy be modified by striking out paragraph 5, so that a person may become a member of the Society who is not a member of the Academy.

It was moved that meetings for 1924 be held on the fourth Thursday of February, April and October and the second Monday of December.

Mr. Cresson added to the report of the Property Committee the receipt of photographs of Philip Nell and R. C. Williams, Jr., and the following additions to the cabinet: 4 paratypes *Cyrtopogon tacoma* Mel., 2 paratypes *Cyrtopogon aldrichi* Mel., 4 topotypes *Melandrea mandibulata* Ald. from A. L. Melander; 1 ♂ 1 ♀ *Panorpa nuptialis* Gers., Texas, from R. H. Painter.

Mr. Rehn moved that $50.00 be transferred from the general funds to the *Entomological News.* This motion was carried.

The following officers and committee members were nominated for 1924:

*President,* Henry Skinner; *Vice-President,* J. A. G. Rehn; *Corresponding Secretary,* Morgan Hebard; *Recording Secretary,* R. C. Williams, Jr.; *Treasurer,* E. T. Cresson; *Publication Committee,* J. A. G. Rehn, *Chairman,* E. T. Cresson, P. P. Calvert; *Finance Committee,* Morgan Hebard, *Chairman,* D. M. Castle, J. A. G. Rehn; *Property Committee,* E. T. Cresson, Jr., *Chairman,* Morgan Hebard, Philip Laurent.

In each case the nominations were closed and on motion the Secretary cast a ballot and the above Officers and Committees were elected.

R. C. Williams, Jr., *Recording Secretary.*

# OBITUARY.

## Alexander Dyer MacGillivray.

On March 24, 1924, Alexander Dyer MacGillivray, one of the most outstanding of present-day teachers of Entomology in America, passed to the Great Beyond. Although there had been repeated warnings that he was overtaxing himself, and he was never robust, his death came as a great shock to most of those who knew him. I last saw him at the Cincinnati Meetings in December, and found him full of plans for the future and insistent that he was feeling much better than he had before in recent years. It was very apparent then that he was far from well, but we had seen his rebound from similar conditions and did not realize that the end was near.

Dr. MacGillivray was born July 15, 1868, at Inverness, Ohio. He entered upon his undergraduate work at Cornell University in 1889 and developed an intensive interest in Entomology. With characteristic singleness of purpose, he turned to this study, which was destined to be his life work, and neglected some of the formal requirements of the undergraduate course. He registered sporadically and followed much his own bent in his work. The result was that when I first came to know him in the fall of 1898 he was technically still classed as a sophomore, although, apart from Slingerland, who gave a brief course in Economic Entomology, he was Professor Comstock's sole assistant in the strenuous teaching work of the Cornell Department of Entomology.

He came to see that he was making a mistake in neglecting his undergraduate work and, with that indomitable will which he possessed, he set about to meet the requirements which were before him. German had always been a bugbear to him and after my first semester, for nearly a year we spent three or more nights a week reading Van Rees, Kowalevsky, and some of the other great classics on metamorphosis. French he found easier, and not long after when his interest in Coccidae developed, he took up and mastered the Italian. I mention these merely to show the strength of his determination,—he often spoke of it himself as his "Scotch stubbornness."

In 1900 he took his Ph.B. degree and in 1904 his Ph.D. From 1900 to 1906 he was Instructor in Entomology and

General Invertebrate Zoology, and from 1906 Assistant Professor at Cornell. In 1911 he severed his connection of twenty-three years with Cornell University and took up work as Assistant Professor of Systematic Entomology at the University of Illinois. In 1913 he was made Associate Professor, and in 1917 he was advanced to a full professorship in Entomology, the position which he held at his death.

His doctorate thesis was *A Study of the Wings of the Tenthredinoidea, a Subfamily of Hymenoptera.* Aside from the collaborated work of Comstock and Needham, this intensive study was the most important of the earlier efforts to elaborate and apply to other orders the principles laid down by Professor Comstock in 1893, when he made his epochal studies of the wings of the Lepidoptera. Using a wealth of material, MacGillivray attempted "to trace the course of the changes wrought by natural selection" and "to apply the principles of descent to taxonomy." He was much interested in the consideration of the dynamical control of wing type, developing especially the thesis that "That wing is the most perfect mechanical device which approaches the closest to some type of truss."

A list of the published papers by Dr. MacGillivray includes eighty titles. It begins with a bibliographic catalogue of the Thysanura of North America, published in 1891, in the Canadian Entomologist. This was followed by a series of five papers under the general title, *North American Thysanura,* reviewing the groups and describing thirteen new species.

In 1893 appeared his first paper on the saw flies, a group which was to claim his chief attention throughout life. In this paper he lists thirty species of Tenthredinidae and Uroceridae from Olympia, Washington, fourteen of which were described as new to science. Something over 400 new species of Tenthredinoidea were described by him before he laid down his work. His most comprehensive study was that on the Tenthredinoidea of Connecticut, a contribution of 190 pages, published in the Bulletin of the Geological and Natural History Survey of Connecticut, in 1916.

His interest in the saw flies was not limited to mere species description, but he had done much upon the immature stages

of these forms, and had published several preliminary papers dealing with this phase of the subject. The greater part of it is included in a bulky manuscript on "Immature Stages of Insects." This work was projected as far back as 1903, when he published in the Bulletin of the New York State Museum his paper on *Aquatic Chrysomelidae, and a Table of the Families of Coleopterous Larvae.* He had brought together a wealth of new material which it is hoped can still be made available for publication.

About 1904, Dr. MacGillivray first offered a formal course on the anatomy and taxonomy of the Coccidae. Entering upon the work with his usual thoroughness and zeal, he soon prepared an extensive series of mimeographed notes which were distributed and a source of aid and stimulus not only to a considerable group of his own students but to a number of outside workers. In 1921 this material was finally brought together in book form under the title, *The Coccidae: Tables for the Identification of the Subfamilies and Some of the More Important Genera and Species together with Discussions of their Anatomy and Life History.*

This work upon the Coccidae has been harshly criticized and undoubtedly it contains much that is not acceptable to other specialists. Dr. MacGillivray was a man of pronounced views and he did not hesitate to put them forth. After careful study of a group he was prone to rearrange and revise it to meet his own ideas, and he was never chary in creating new generic and group names. To those knowing his long interest in the scale insects and his painstaking methods of work, the implication that the text was mainly compilation and that his acquaintance with the insects themselves was limited, seems wide of the mark, however debatable the opinions expressed may be.

In 1923, only a few weeks before the author's untimely death, appeared his *External Insect Anatomy, a Guide to the Study of Insect Anatomy and an Introduction to Systematic Entomology.* In many respects this is to be regarded as his most important published work. With a background of over thirty years of systematic work and a remarkably broad knowledge of insect groups, this little book presents a fund

of information which will be more and more appreciated as it is studied intensively. Unfortunately, it is cumbered by a nomenclature and a phraseology which is certain to prove irritating and which is likely to repel the casual student.

In neither it nor the coccid book is any attempt made to put the material in attractive form. Dr. MacGillivray had no patience with a prevalent viewpoint that work must be sugar-coated in order to justify itself. A favorite expression of his was that of "holding the student's nose to the grindstone." He attracted few general students and he held few supposedly interested in specializing who were not willing to pay the price.

This attitude is well illustrated by a typical statement in the preface to the coccid book:

"The fact that no figures are included in this Volume may appear to many as an error. The tables were prepared primarily for the use of students. Those who have had any experience in teaching know that most students will not undertake anything they are not forced to do. The omission of figures makes it necessary for them to study their specimens rather than figures."

More than one reader of this sketch will recall specific and personal experiences with this same viewpoint. For the purpose of orienting the graduate student in the departmental work, it was Professor Comstock's practice to require all entering upon the laboratory work to take the elementary course in morphology and wing venation. This course was MacGillivray's delight. He was no respecter of persons, unless it was to the extent that the teacher of years of experience and possibly a wide general acquaintance with the field of entomology, was likely to have the screws turned on him even more tightly than on the veriest tyro among the undergraduates. How some of them did rage and what indignation meetings were held over some insistence upon detail or upon conformity to what seemed a perfectly arbitrary requirement! And yet, wherever those men met in after years they delighted to recount these experiences and would close with the declaration that it was the most valuable drill which they had ever had in their biological work.

But those who were privileged to really know him, knew full well that this represented only one side of the man. Sen-

sitive to a degree, he valued friends and friendship to an extent that many did not realize. He was keenly interested in his students personally and his home was always open to them.

His love for children and his interest in them was a characteristic which was known to all of his close friends. Even to many of those who knew him intimately it will be a surprise to learn that among his cherished plans was the publication of a book of "Insect Stories" for children, and that a considerable amount of work had been done upon it.

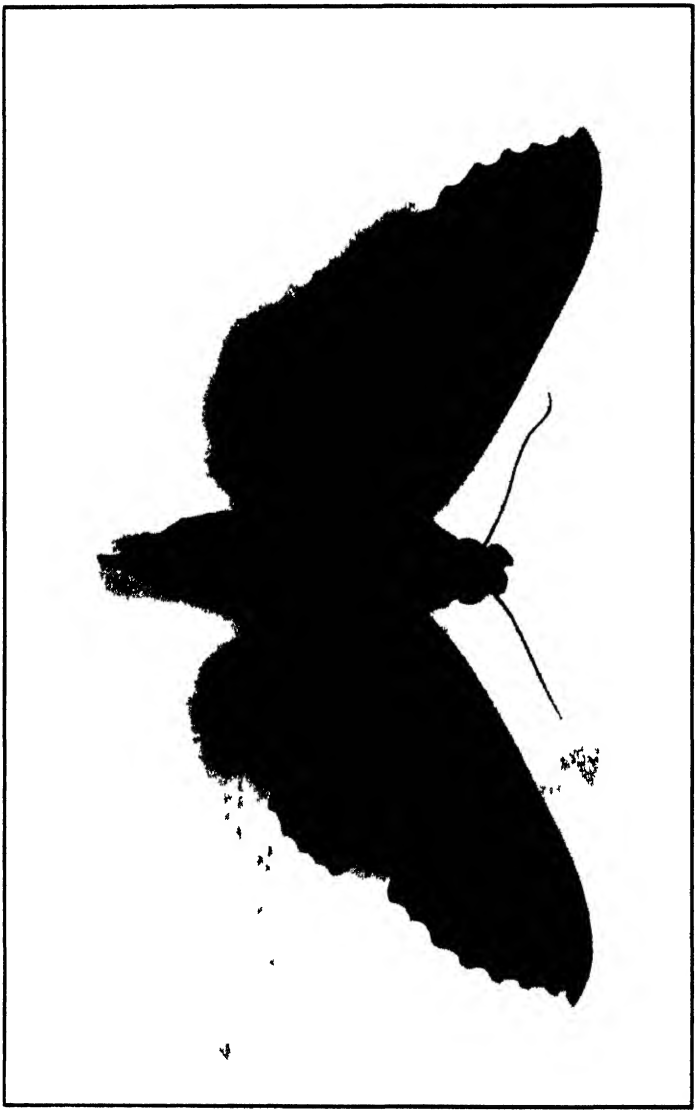
Dr. MacGillivray was a member of the various technical societies in the field of zoology, but it was to the Entomological Society of America, during its earlier years, that he gave unstinted service. A charter member, he was second vice-president in 1911 and from 1911 to 1916 he served most faithfully and efficiently as secretary-treasurer. In recent years, owing largely to ill-health, he was seldom seen at the annual meetings.

During his days as a graduate student at Cornell he was one of the organizers and active supporters of a Biological Club which was almost a fraternity in its careful selection of members and in the *esprit de corps* which it developed among the chosen graduate students and the younger instructors. To MacGillivray its meetings were a delight, and filled much the same place as does a club for some men. In later years he derived especial pleasure from his membership in the Gamma Alpha Graduate Scientific Fraternity, because of the opportunity it afforded him for informal social contact with the younger men in the scientific field. To an extent unusual for the older men, he retained this contact and an active interest in the welfare of the society and its members.

In the passing of Dr. MacGillivray, the science of entomology loses a unique and an outstanding disciple. A large number of students who have come under his influence, and others who have been associated with him mourn the loss of a stimulating and valued helper and a true friend. WM. A. RILEY.

## CORRECTION

Page 169, lines 5 and 12, for *Calochartus*, read *Calochortus*. Page 170, line 23, for *Betheliella calocharti* new species read *Betheliella calochorti* new species.



KLONEUS BABAYAGA.—SKINNER.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV JULY, 1924 No. 7


CONTENTS



## Kloneus babayaga (Lepid.: Sphingidae).

By HENRY SKINNER.

(Plate IV.)

*Kloneus babayaga*, a very interesting sphinx moth, was described by me in this journal[1] as a new genus and species. It was captured by Mr. J. S. McKenzie, at the Eden Mine, Nicaragua, June 13th, 1922, and by him presented to the Academy of Natural Sciences of Philadelphia.

*Oberthurion harroverii* Clark[2] is a synonym of *K. babayaga*. The specimen of *babayaga* is a female and *harroverii* a male, and the latter was collected by David E. Harrower, July 21st, 1915, on the Chirripo River, Costa Rica, and presented to the Academy of Natural Sciences of Philadelphia.

The Proceedings of the New England Zoological Club, containing the description of *O. harroverii* bears the date, Cambridge, May 12, 1923, and the copy sent me bears the postmark, Boston, May 18th.

[1] ENTOMOLOGICAL NEWS, XXXIV, 138. 1923.

[2] Proc. New England Zoological Club, VIII, 58. 1923.

Entomological News, containing the description of *Kloneus babayaga,* was mailed at the post-office at Philadelphia, May 4, 1923.

The type of *Oberthurion harroverii* Clark was borrowed for study and description by B. Preston Clark, September 25, 1922, and has not been returned to the Academy of Natural Sciences of Philadelphia.

## The Occurrence of Nygmata in the Wings of Insecta Holometabola.

By Wm. T. M. Forbes, Ithaca, New York.

(Plate V.)

It is well known that the majority of Trichoptera possess two small, apparently glandular spots on the wings, one located in the base of cell R4, and the other, somewhat less universally in cell M. Navas has christened these structures "nigmas," according to the reformed spelling of Spanish. In English we should follow the spelling of the Greek word and call them "nygmata" (singular "nygma"). The word means merely a spot or puncture, and that is all that is really known of them. On account of their presence near the center of the wing, and tendency to be absent in small species, one may suspect them of being moulting fluid glands for the imaginal moult, but I believe there is no evidence whatever on the case.

Finding that essentially the same structures are also present in the sawflies, I made a systematic search of the principal groups of insects, with the following result.

Nygmata are present in a large proportion of species of the Neuroptera (including the Planipennia), Trichoptera, Panorpata, and the Chalastogastrous Hymenoptera. They are absent in all the Hemimetabola examined, and also in the Lepidoptera and Diptera. They are also absent from the wings of Coleoptera, but the question may be raised if some of the various structures on the elytra of Coleoptera may not be homologous.

The position of the nygmata is definite in any one group, but occasionally they are present or absent in closely related forms, especially in the Hymenoptera, where they are frequently weakly developed. The various families of an order have simi-

lar arrangements, but the various orders have less in common.

The following list summarizes their occurrence:

NEUROPTERA.

Sialidae: Cells R, R5, and M; sometimes more than one in a cell; sometimes none in cell M (fig. 2); absent in *Sialis*.

Ithonidae, Dilaridae, Polystoechotidae, Osmylidae (fig. 3), and the isolated genus *Porisma;* cells homologous to R4 and to R.

Psychopsidae: cell R only, and very close to base of wing.

Sialinae, Raphidiidae, Mantispidae, Sisyridae, Sympherobiidae, Hemerobiidae, Berothidae, Chrysopidae, Myrmeleonidae, Nemopteridae, Ascalaphidae, and Coniopterygidae: nygmata absent.

TRICHOPTERA.

Present in cells R4 and M; frequently absent.

PANORPATA.

*Panorpa* and *Panorpodes*: cells R, R5 and Cu (fig. 6).
*Bittacus*: cells R and R5 only (figs. 4, 5).
*Merope*: and apparently *Notithauma*: nygmata absent.

HYMENOPTERA.

Siricidae: second and third submarginal cells, median, third discoidal of Cresson (sometimes called first discoidal), submedian. Frequently with two nygmata in a single cell, and occasionally with three.

Xyelidae, Lydidae (fig. 1): second and third submarginal, median, first lanceolate. Weak and frequently absent in part.

Xiphydriidae: second submarginal and sometimes median only.

Tenthredinidae: second and third submarginals, or more often second submarginal only; median.

Blasticotomidae, Megalodontidae: second and third submarginals, median.

Cephidae: at base of second submarginal only.

Oryssidae and Clistogastra: absent so far as examined.

It will be noted that the Hymenoptera have the most complete set of any single order. While the homologies of the cells to those in other orders is not at all certain, the following coincidences can be recognized: cell M (median), in Hymenoptera, Trichoptera and a few Sialidae, but not in other Neuroptera, or Panorpata; cell R5 (second submarginal ?), in Hymenop-

tera, Sialidae, and Panorpata, but not in Trichoptera; cell Cu (submedian) in Hymenoptera and Panorpata only; cell 2dA (lanceolate) in Hymenoptera only. The most persistent nygma in other orders is the one in cell R, but this is not to be expected in the Hymenoptera as almost the whole of that cell is obliterated by the fusion of R and M.

In the figures I have indicated the position of nygmata as closely as possible, but have exaggerated their size.

EXPLANATION OF FIGURES IN PLATE V.

1. Hymenoptera, Lydidae, *Lyda.*
2. Neuroptera, Sialidae, *Chauliodes pectinicornis.*
3. Neuroptera, Osmylidae, *Osmylus tuberculatus.*

4, 5. Panorpata, Bittacidae, *Bittacus* (with bases of wings, more enlarged).

6. Panorpata, Panorpidae, *Panorpodes.*

## Note on Phaedrotes piasus Bdv. (Lepid.: Lycaenidae).

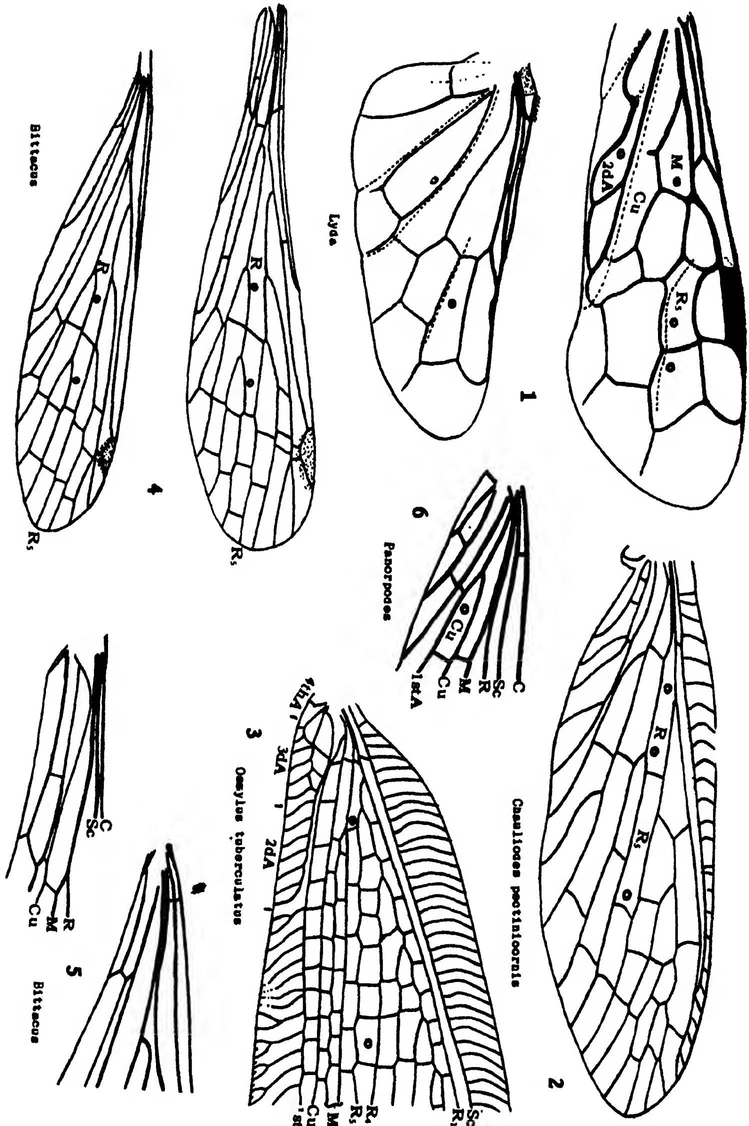
By WM. BARNES and F. H. BENJAMIN, Decatur, Illinois.

In a recent paper (1923 Ent. News XXXIV, 295-300) Mr. K. R. Coolidge requests that someone publish on the distinctions between the various races of *P. piasus.*

This has already been discussed by Dr. McDunnough (1914, Ent. Rec., XXVI, (9), 201).

There are obviously three races of the species. One is found in the mountainous regions of California, and has the underside pale grey, in general the white area rather diffuse and the subterminal lunules rather poorly defined, seldom showing any orange at the anal angle of the secondaries. This is *P. piasus piasus* Bdv., according to M. Oberthür's figure of Boisduval's type. Specimens must be compared with the types of *sagittigera* Feld., and *viaca* Edw. to be sure that these have been correctly placed. Felder's figure, however, seems to place the name; notes in a manuscript catalogue read: "Collected by Lorquin; locality indefinite; probably received thru Boisduval."

The type of *viaca* Edw. may be in the Carnegie Museum, but Dr. McDunnough evidently failed to find it. Notes read: "Type locality Sierra Nevada, California, ♂, ? Carnegie Museum." In view of the locality and original description and




NYGMATA IN WINGS.—FORBES.

in absence of any material actually compared with type, the name may tentatively rest under *P. piasus piasus.*

The name *lorquinii* Behr. (listed in the "Additions and Corrections" of the Check List as *lorquini*) apparently also falls here, the types presumably destroyed.

*P. piasus catalina* Reak. is the race from the vicinity of Los Angeles County, California. It is much darker grey below, the hind wing with the white less suffused and bordered by a s. t. band of well defined black crescents, which toward the anal angle are frequently bordered by yellow-orange. This race lacks ocelli to the submarginal lunules preceding the anal angle of the secondaries. A faint ocellus may be present at the anal angle. A specimen has been compared with the type of *catalina* in the Strecker Collection. M. Oberthür's figure of the type shows *rhaea* Bdv. to be a synonym.

*P. piasus daunia* Edw. A specimen from "Colo. Bruce," is in the Barnes Collection marked "X. T. (Pittsburgh) J. McD." This race is very close to *catalina*, the main distinction being the presence of black ocelli on the hind wings distad of the submarginal lunules preceding the anal angle.

Quite naturally intergrades between the various races occur, and probably occasional aberrational specimens from any locality might be made to "fit" each name, but in general the various races breed true and are restricted. It is quite questionable if the authors would propose a name for *daunia* if no available name were in the literature, but the tendency seems to be to "split" each species of diurnal into as many races as possible, and once a name is proposed for a form which seems to have a different geographical distribution than another form, it seems advisable to retain the name to avoid further synonyms.

In fact, many names are retained in the Check List, and in all other lists, if the insect has not been properly identified or its correct status is unknown. The work of a cataloguer is not a revisional one and must necessarily be based mainly on published work. Consequently some names listed as synonyms will ultimately be assigned to racial rank, while others listed as species will prove to be synonyms.

# A Note on Some Hippoboscidae (Diptera Pupipara).

By G. F. Ferris, Stanford University, California.

## Ornithoctona Speiser.

**Ornithoctona strigilecula** (Ferris).

1923. *Ornithomyia strigilecula* Ferris, Parasitology, 15:57-58; tf. 3-4.

Since the description of this species was published, certain material has been obtained which throws some light on the genus *Ornithoctona* and indicates the necessity of the change indicated above.

The genus was originally based upon the character of the antennae, which permitted its separation from *Ornithomyia*. The differences in the two genera, however, are not especially striking and the separation on this basis not very convincing, but the material now at hand reveals a character which very strongly reinforces that heretofore used. In my description of *Ornithomyia strigilecula* I called attention to the peculiar and apparently very distinctive transverse comb of setae on the basal segment of the posterior tarsi, a character that, as far as I am aware, had never been noted in any species. It now appears that this comb is characteristic of the species of *Ornithoctona,* it being present in two species from Borneo that are at hand and which will be described in a forthcoming paper to be published in the journal of the Sarawak Museum.

This character is very distinctive. None of the species of *Ornithomyia* that are available show anything of the sort, this segment of the posterior tarsi bearing merely a larger or smaller number of irregularly arranged, stout setae.

## Ornithoica Rondani.

In all, ten species have at various times been referred to this genus. It is entirely possible that there are more names than species and in fact, Austen[1] has indicated his belief that *O. exilis* (Walker) and *O. vicina* (Walker) are identical with *O. becariina* Rondani, and in addition has expressed the suspicion that all of these are likewise identical with *O. confluenta* (Say).

[1] Austen, E. E. Notes on Hippoboscidae (Diptera Pupipara) in the Collection of the British Museum. Ann. and Mag. Nat. Hist. (7), 12:263. (1903).

Aldrich[3] accepts these views and in addition places *O. pusilla* (Schiner) and *O. promiscua* Ferris and Cole in the synonymy with *confluenta* (or *confluens* as he would have it).

On this basis *O. confluenta* becomes a species of practically cosmopolitan distribution, in itself a rather surprising thing for a form which is not known from any very wide ranging hosts. That the determinations upon which this synonymy is based are not to be relied upon is indicated by material now at hand. I have a single specimen of an *Ornithoica* from Borneo—which will be described in detail in the forthcoming paper mentioned above and which I take to be in all probability *O. becariina*. It differs very markedly from *O. promiscua* at least, but the differences are such that a Dipterist working with his conventional pinned and shriveled material would almost certainly overlook them.

It is evident from this that the earlier determinations need to be revised. In this connection I would call attention especially to the facts in regard to *O. confluenta*. In our description of *O. promiscua* Ferris and Cole, we expressed the belief that *confluenta* is unrecognizable from the original description. Nor, as far as I am aware, has the species ever been redescribed from authentic—or for that matter, any other—material. Aldrich, however (ref. cited) without adducing any evidence whatsoever in support of his opinion, cavalierly reduces *O. promiscua* to synonymy with *confluenta* as well as assigning to the latter numerous specimens from geographically widely separated regions. Until such time as *confluenta* has been redescribed from material that may be regarded as authentic, it would appear quite reasonable and proper to maintain the distinctness of *O. promiscua*.

## A Chance for Lepidopterists.

Staudinger and Bang-Haas, Dresden, Blasewitz, Germany, have recently issued a price list of Lepidoptera. The specimens and species are sold in lots, representing the species in genera from various parts of the world. The prices are reduced and thus a good way is offered to start a collection at a reasonable cost.

[3] Aldrich, J. M. Notes on the Dipterous Family Hippoboscidae. Insecutor Inscitiae Menstruus 11:79. (1923).

# An Analysis of a Bimodal Variation in Size of the Parasite Dasymutilla bioculata Cresson (Hymen.: Mutillidae).*

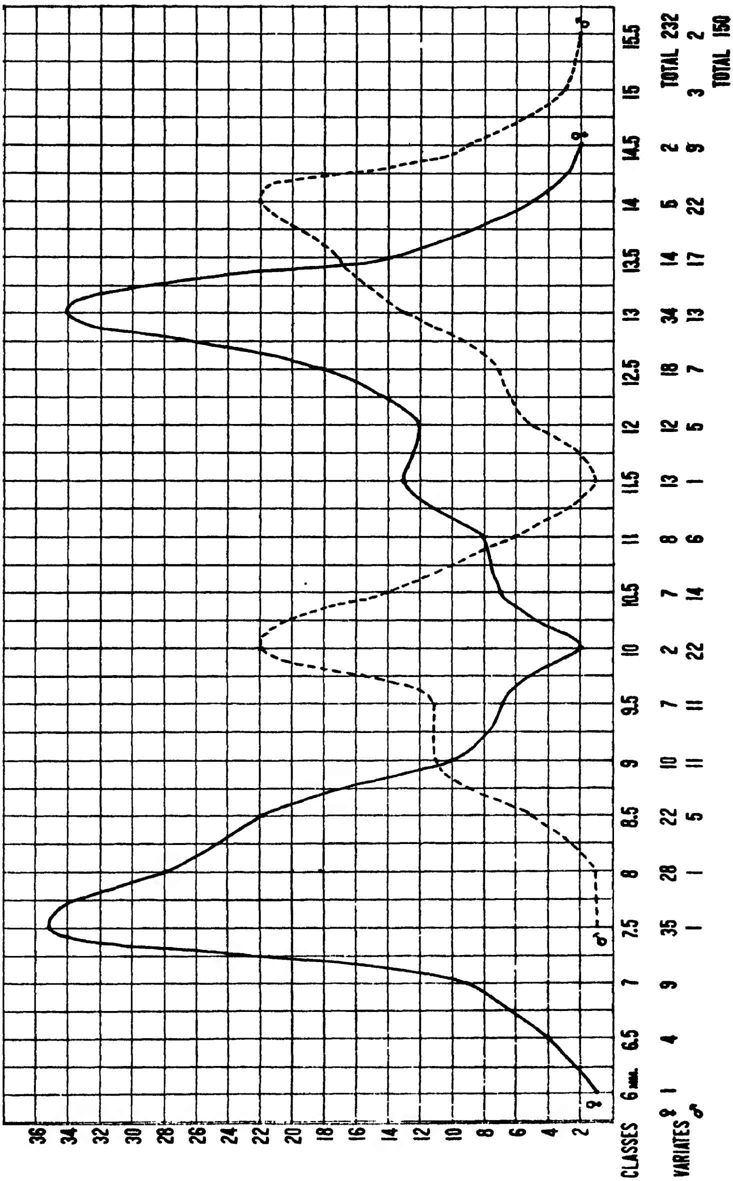
By Clarence E. Mickel,
Department of Entomology, University of Minnesota.

(Plate VI, and Text Figures.)

That there are variations in size among individuals of the same species of insect is well known among entomologists and has been the subject of a number of investigations. These have had as their object either the collection of data regarding the character and extent of the variations, or the demonstration of the causes for the phenomenon itself. The variations which are present in various species of animals and plants may be divided into two very fundamentally different classes; those which are genetic in character, and those of an ecological nature. Variations of the first class are due to some reaction that occurs in the germ plasm, while those of the second class are due to the effect of some stimulus in the environment, and are therefore ecological. The principal ecological factors which have been suggested as causes for variation in size are temperature, humidity, light, chemical stimuli and nutrition, the last-mentioned including both quantity and quality of food. An excellent review of the literature on this subject has been made by Bachmetjew (1907). In the case to be discussed the factors of temperature, humidity, light, chemical stimuli and quality of food apparently vary in a uniform manner, while the quantity of food is small in some cases and large in others.

The quantity of the food supply has been used by a number of authors to account for the variations in size which occur within the same species of insect. Koch (1856) studied the lepidopteron *Vanessa io* var. *joides* Dahl and concluded that it was a variety based on small specimens of *Vanessa io* and that their small size was due to the starvation of the larvae. Berlepsch (1860) performed an experiment with the larvae of queen bees and states that he was able to reduce the size of the

*Published with the approval of the Director as Paper No. 438 of the Journal Series of the Minnesota Agricultural Experiment Station.




Frequency Curve of Variation in Size of Male and Female of Dasymutilla bioculata Cresson.—Mickel.

queens by reducing the food supply of the larvae. Kleine (1867) states that worker bees of inferior size are produced from poorly fed worker larvae. Brehm (1869) reared a specimen of the dipteron *Anthrax semiata* or *morio* L. from the cocoon of a bumblebee. He thought the variations in the size of this species were due to different quantities of food which were available to the larvae. Stepanow (1882) found that the larvae of the bombyliid *Systoechus leucophaeus* Meigen had different sizes which he thought depended upon the quantity of food in the egg masses of the orthopteron, *Stauronotus vastor* Stevens, upon which the larvae feed. The adult flies also exhibited the same variation. Standfuss (1896) reared the larvae of *Aglia tau* L., a saturnid moth, on a subnormal amount of food and obtained adult moths which were much reduced in size. Bordage (1899) reports a similar experiment with *Atella pholanta,* a vanessid. Rudow (1900) observed the variations in size which are present in the species of various genera of the aculeate Hymenoptera and states that the quantity of food available to the larvae of these forms is undoubtedly the cause of the variations in size. Herms (1907) conducted some feeding experiments with a sarcophagid fly, *Lucilia caesar* L., in which he allowed the larvae to consume as much as they would, and varied the length of the time of feeding. These time periods varied from thirty-six hours, which seemed to be the lower limit at which adults could be secured, to an optimum period of from sixty to seventy-two hours. He obtained adult flies varying from a minimum size with thirty-six hours' feeding to the normal size which were fed for a period of sixty to seventy-two hours. Wodsedelak (1917) has carried on some interesting experiments with the larvae of a dermestid, *Trogoderma tarsale,* in which he has been able to vary their size from large to small by starving, and from small to large by feeding again. No data are available as to the effect of this sort of feeding on the adult beetles.

In all of the cases which have been reviewed it is obvious that the variations have to do with a single species. If a graph is made representing the frequency and range of any of these

variations the resulting curve is unimodal, that is, all of the specimens exhibiting variation group themselves progressively around the most abundantly represented form. If, however, the circumstances should be such that when a graph of the frequency and range of the variation is made, the resulting curve is bimodal, it is not so apparent that one is dealing with a single species. In fact, from an examination of museum specimens only, one might be led to the conclusion that two species were represented rather than one, and an investigation of the organism and its environment would be necessary before one could arrive at the true state of affairs. In cases of this kind the variation may appear to be discontinuous, but a study of the data seems to show that it is more correct to consider it as a continuous variation of the bimodal type, and such variations may well be designated as bimodal. It is conceivable that variations of this kind occur which may show curves with three or even more modes. Kellogg and Bell (1904) have mentioned the possibility of bimodal or even polymodal variations.

*Dasymutilla bioculata* Cresson offers a good example of variation which displays the bimodal characteristic. When a large number of individuals of this species are arranged in a gradatory series, the curve expressing the frequency and range of the differences in size is bimodal. The case is an interesting one because the variation in size can be definitely attributed to an ecological factor, and because it emphasizes the importance of a knowledge of the ecology of an insect to a taxonomist in determining specific limits.

*Dasymutilla bioculata* is a mutillid wasp, which is exceedingly abundant in the sand dune areas of Minnesota. My attention was first attracted to the species in making a collection of Mutillidae in a sand dune area two miles north of the city limits of Minneapolis in Anoka county. The principal collecting ground in this sand dune area is a blow-out (a depression blown out by the wind in areas of shifting sand) about ten acres in extent. During the season of 1922, nearly 1200 specimens of Mutillids were collected in this blow-out. Other species of Hymenoptera were also abundant, particularly two

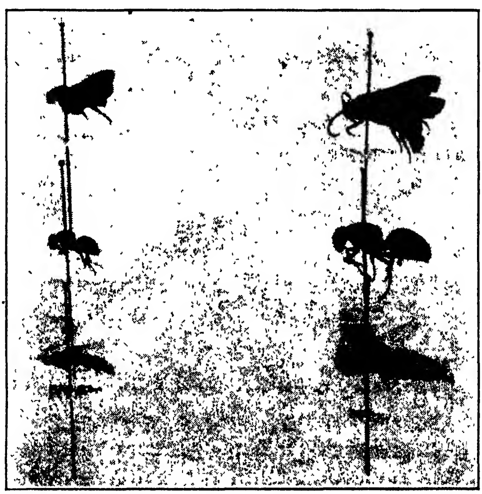
species of Bembicidae, *Bembix pruinosa* Fox and *Microbembex monodonta* Say, and the Sphecid wasp, *Sphex argentatus* Hart. In general, the hymenopterous fauna of the sand dune areas of Minnesota is very similar to that of the sand areas of Illinois, which has been discussed by Hart (1907). The collection of 1922 showed that the most abundant Mutillid in this blowout was the male *Dasymutilla bioculata* Cresson, and the female *Dasymutilla chlamydata* Melander, which was described from specimens taken in the Illinois sand areas. When this material was worked over for classification, it was found that the 440 specimens of the female *chlamydata* could be separated into two series according to size, that is, those varying between 6.5 mm. and 10 mm. and those varying between 11 mm. and 15 mm. The 206 specimens of the male *bioculata* could also be separated into two similar series. No structural characters could be found for separating these two series, either in the female *chlamydata* or the male *bioculata*. The genitalia of the males in the two series were compared, but no differences could be found. Hart (1907) first suggested that *chlamydata* was probably the female of *bioculata*, but retained the name *chlamydata* for all his specimens. During the season of 1923 specimens of the female *chlamydata* and the male *bioculata* were reared from the same host and were successfully mated in the laboratory. Specimens were also taken *in coitu* in the field. *Dasymutilla chlamydata* Melander therefore becomes a synonym of *Dasymutilla bioculata* Cresson.

Knowing that the Mutillidae are parasitic upon wasps and bees, and that the species *Microbembex monodonta* Say and *Bembix pruinosa* Fox were the most abundant Hymenoptera in the blowout, it occurred to me that probably they were parasitized by one or more species of the Mutillids. It also seemed probable that *Dasymutilla bioculata* was the Mutillid concerned, parasitizing either one or the other, or both of the Bembicids.

I therefore collected 285 cocoons of *Microbembex monodonta* on May 29 and brought them to the laboratory. Eighty-five cocoons of *Bembix pruinosa* were collected on June 30 and brought to the laboratory. Each cocoon was placed in a glass

vial so that a definite record could be kept of each one. From the 285 cocoons of *Microbembex monodonta* I obtained 6 males and 5 females of *Dasymutilla bioculata* ranging in size from 7 to 10 mm. From the 85 cocoons of *Bembix pruinosa* I obtained 1 male and 3 females of the same Mutillid ranging in size from 11 to 15 mm. When a recently emerged female of the latter group was placed with a male of the small series they mated immediately. The specimens taken in copulation in the field had the following length measurements: female, 6.5 mm. and male 11.5 mm.

The adults of *Microbembex monodonta* vary in size from 8 to 14 mm. while those of *Bembix pruinosa* vary between 16 and 19 mm. The same proportional differences exist in the size of the mature larvae of the two species. The larvae of *Dasymutilla bioculata* parasitize the cocoons of both the small *Microbembex* and the large *Bembix* and entirely consume the Bembecid larvae before they enter the prepupal stage. The specimens of *bioculata* emerging from the cocoons of the small *Microbembex* vary in size from 6.5 to 10 mm., while those



**Correlation in size between *Dasymutilla bioculata* Cresson and its hosts *Microbembex monodonta* Say (left) and *Bembix pruinosa* Fox (right). In each vertical row: female above, male in the middle, host below.**

which emerge from the large *Bembix* vary in size from 11 to 15 mm. Inasmuch as temperature, humidity, light, quality of food, and other ecological factors vary uniformly in this sand dune area, while we know that the quantity of food is considerably less in the *Microbembex* cocoons which produce the small *bioculata* than the amount of food in the *Bembix* cocoons which produce large *bioculata*, it seems justifiable and reasonable to conclude that the quantity of food available to the larvae of *Dasymutilla bioculata* is the factor which determines the size that the adult will be. The quantity of food may be either large or small according to the species of Bembicid which the Mutillid parasitizes.

As stated previously when a curve is plotted representing the frequency and range of the variation in size of a large number of specimens of *Dasymutilla bioculata* the curve will be found to be of the bimodal type. The first mode will represent the specimens which as larvae were parasites of *Microbembex monodonta* Say, and the second mode will represent the specimens which as larvae were parasites of *Bembix pruinosa* Fox. Thus it is clear that in this case at least, what appears from an examination of museum specimens to be a specific difference in size is in reality an ecological variation of the bimodal type, due to a difference in the quantity of the food supply. May not variations of this kind account for some of the supposedly specific differences which we encounter in other groups of insects?

BIBLIOGRAPHY.

BACHMETJEW, P. 1907. Experimentelle Entomologische Studien, ii, 299-312, 596-597, 765-768. Staatsdruckerei, Sophia.

BERLEPSCH, A. v. 1860. Die Biene und die Bienenzucht in honigarmen Gegenden nach dem gegenwärtigen Standpunkt der Theorie und Praxis. Mühlhausen im Thüringen.

BORDAGE, EDMOND. 1899. Expériences sur la relation qui existe entre la couleur du Mileu et la couleur des Chrysalides de certains Lépidoptères. Proc. Fourth Int. Cong. Zool. Cambridge, 235-244. London.

BREHM, ALFRED EDMUND. 1869. Illustrirtes Thierleben. I. Auflage. vi. Wirbellose Thiere. Hildburghausen.

CRESSON, E. T. 1865. Catalogue of Hymenoptera in the

Collection of the Entomological Society of Philadelphia, from Colorado Territory. Proc. Ent. Soc., Phila., iv, 431.

FOX, WILLIAM J. 1895. Synopsis of the Bembicini of Boreal North America. Proc. Acad. Nat. Sci., Phila., 361.

HART, CHARLES A. 1907. Zoological Studies in the Sand Regions of the Illinois and Mississippi River Valleys. Bull. Ill. Lab. Nat. Hist., vii, 195-272.

HERMS, WILLIAM B. 1907. An Ecological and Experimental Study of Sarcophagidae with Relation to Lake Debris. Journ. Exp. Zool., iv, 45-83.

KELLOGG, VERNON L. and BELL, RUBY G. 1904. Studies of Variation in Insects. Proc. Wash. Acad. Sci., vi, 203-332.

KLEINE, G. 1867. Ueber das Gesetz der Entwickelung der Geschlechter bei den Insekten. Zeitschr. für wissensch. Zool., xvii, 533-538.

KOCH, G. 1856. Die Schmetterlinge des westlichen Deutschlands. Kassel.

MELANDER, A. L. 1903. Notes on North American Mutillidae, with Descriptions of New Species. Trans. Amer. Ent. Soc., xxix, 299.

RUDOW. 1900. Weiterer Beitrag zu den Grössenverhältnissen der Insekten. Insekt.-Börse, xvii, no. 24, 188-189.

1900. Ueber die Grössen-Variation bei Insekten. Insekt.-Börse, xvii, no. 2, 10-11.

SAY, THOMAS. 1824. Narrative of an Expedition to the Source of St. Peter's River by Keating, ii, appendix, Zoology. Philadelphia.

STANDFUSS, M. 1896. Handbuch der paläarktischen Grossschmetterlinge für Forscher und Sammler. 2-te Auflage. (392 pp.). Jena.

STEPANOW, P. G. 1882. Ueber Metamorphosen bei Dipteren der Familie Bombylidae. Arbeit. der Naturforscher-Gesellsch. bei der Univers. zu Charkow, xv, (1881), 1-9.

WODSEDALEK, J. E. 1917. Five Years of Starvation of Larvae. Science, xlvi, 366-367.

## Odors Attractive to Ovipositing Mosquitoes (Dipt.: Culicidae).

By S. E. CRUMB, United States Bureau of Entomology.

Experiments carried on in 1923 indicate that certain odors emanating from water exercise a strong influence upon mosquitoes with regard to the place chosen for oviposition. In these experiments, which were carried on at Clarksville, Tenn., dur-

ing the period August 3 to October 1, 1923, earthenware jars, usually of two-gallon capacity, were filled three-fourths full of water to which the odorate was added. But three or four jars each provided with a different odorate were exposed simultaneously in a series and one jar of the same size as the others was filled with an equal amount of tap water as a check. The jars were kept in a darkened place outdoors and were examined daily. The results obtained with the various odors are indicated below:

| Odorate | No. Nights Run | No. Egg Masses |
|---|---|---|
| Hydrogen Sulfide | 38 | 11 |
| Old Yeast Infusion | 23 | 33 |
| Methane | 8 | 2 |
| Stale Urine | 22 | 24 |
| Check | 52 | 0 |
| Indol | 10 | 0 |
| Hay Infusion | 4 | 0 |
| Ethyl Mercaptan | 2 | 0 |
| Rich Earth | 4 | 0 |
| Skatol | 11 | 0 |
| Carbol Dioxide | 6 | 0 |

It will be noted that the first five of the substances listed above seem to have attracted ovipositing mosquitoes, while the water check did not secure a single egg mass during the 52 nights that it was exposed. It seems probable that the attractive principles involved in these experiments are all products of bacterial action since hydrogen sulfide and methane belong to this class and the yeast infusion and dilute urine only became attractive after standing about a week when they had acquired a sewage-like odor. These preferences of the ovipositing mosquitoes are possibly correlated with the food habits of the larvae which may subsist largely upon bacteria or associated Protozoa.

Adults were bred in several cases from the egg masses secured in the above experiments and all were determined by Dr. H. G. Dyar as *Culex pipiens* Linn.

This work is being continued in the hope that we may be able to discover an attractant sufficiently powerful to concentrate a large share of the mosquito oviposition in a locality in a few receptacles where the eggs or larvae may be readily destroyed.

# Studies in the Genus Mecas (Coleop.).

By J. O. Martin, Berkeley, California.

On June 15, 1921, Mr. Vance S. Brown, Lumberman of the Lassen National Forest, collected for me, from *Artemisia tridentata,* a single specimen of a *Mecas.* The following summer I captured by beating the same shrub, which is the common sage brush, about twenty specimens of the same beetle. In Horn's table[1] to the genus *Mecas* this species runs to *inornata* (Say), but after a careful study of the literature of the genus I am convinced that a change is necessary, involving the *Saperda concolor* of LeConte. In 1824 Thomas Say described[2] the species *inornata* as a *Saperda* and distinctly states that it shows no trace of thoracic callosities. LeConte, in 1853[3], described *Saperda concolor,* but his description does not differentiate it from *inornata,* except in the shape of the elytral termination. In looking over a series of *concolor,* I have noted specimens in which the apex of the elytra have a slight break in the outline which might excuse one for calling it sub-acute. Horn, in the above cited table, was, as far as I can find, the first one to place *inornata* in the genus *Mecas.* Le Conte himself says, in the same paper in which he described *concolor* (speaking of inornata), "This is possibly the male of *S. concolor.*" It would seem therefore that *concolor* is a synonym of *inornata* and that the species of *Mecas* that has been called *inornata* is undescribed. I offer the following description and name.

**Mecas bicallosa,** new species.

Body black, shining throughout, which, seen through the white vestiture, gives to the species a dark lead color; length 10-13 mm. Head moderately convex on occiput and front, with coarse deep punctures which average less than the diameter of a puncture apart; each of these large punctures with a long sub-erect seta clouded with black which is darker on the front; surface between the large punctures with numerous finer ones each bearing a recumbent white hair, shorter and finer than the setae and nearly concealing the surface, these hairs are

[1] Trans. Am. Ent. Soc. VII, 1878, p. 44.
[2] Jour. Acad. N. S. Phil. III, 1824, p. 407.
[3] Jour. Acad. N. S. Phil. Ser. 2, II, 1852, p. 155.

shorter on the front. Antennae about three-fourths the length of the body; basal joint similar in punctation and vestiture to head, third and fourth joints with white hairs at base becoming black distally, giving these points an annulated appearance and with fewer of the seta bearing punctures; the remaining joints black, not annulated.

Prothorax one-fifth wider than long, slightly narrower in front, moderately arcuate on the sides, more so in the males as a rule but variable in a series; punctuation and vestiture similar to that of the head, except that the sub-erect setae are cinereous in color; on either side of the median line at about the middle is a well marked glabrous callosity, there is also a tendency for a narrow glabrous condition along the basal half of the median line, very marked in some specimens, absent in others, apparently without regard to sex.

Elytra distinctly wider at base than thorax, with punctuation and vestiture the same as head and prothorax except that the coarse punctures have a roughly lineal arrangement and become wider apart toward the apical area.

Under surface of the body and legs clothed with recumbent white hairs and setae. Tarsal claws with a well marked tooth at about the middle which is slightly larger in the males. Fifth ventral segment of the female with a longitudinal suture like median line. The male lacks this line but has a strongly marked, roundly outlined, triangular depression. The males are as a rule less robust than the females and shorter.

Described from a series of twenty specimens taken at the base of Antelope mountain in Lassen County, California, on *Artemisia tridentata*. *Type*, a ♀ and allotype ♂ in the collection of the California Academy of Sciences.

## New Species of Ernestia and Mericia (Dipt.: Tachinidae).*

By C. Howard Curran, Ottawa, Ontario.

Since Dr. J. D. Tothill's revision of the genus *Ernestia*[1], considerable additional material has been accumulated by the Canadian National Collection and this is found to contain four well-marked new species which are described in the following pages.

* Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

[1] Can. Ent., LIII, 1922.

As shown in a recent article in this journal[3], the genus *Ernestia,* as understood by Tothill, contained two distinct genera. One of the species described below is a true *Ernestia,* the remainder belonging to the genus *Mericia.*

**Ernestia (Faustia?) fasciata** n. sp.

Allied to *Ernestia (Metaphyto) genalis* Coq., but the posterior claspers have no keel and the wide parafacials are normally hairy; the posterior claspers end in a laterally compressed, slightly widened elongate knob. Length 9.5 to 11 mm.

♂. Front two and one-half times as wide as length of second antennal segment. Head silvery greyish pollinose, including the blackish frontal vitta in certain lights, the middle of the face and a stripe on the inner edge of the parafacials, expanding below, reddish in ground color; parafacials two-thirds as wide as middle of face with long, rather coarse hair. Antennae black, third joint one and one-third as long as second, the third joint rectangular, slightly over one and one-half times as long as wide; arista blackish, thick on basal half, tapering to a fine point from before the middle. Palpi black, the moderately broadened apical third reddish. Vibrissae situated well above the oral margin, sometimes not strongly differentiated from the stout accompanying bristles which are more abundant than usual.

Thorax black, the mesonotum thinly greyish pollinose (almost bare), leaving two narrow darker vittae on either side. Scutellum reddish with diffuse darker base and sides. No hairs beneath the inner end of squamae. Wings cinereous hyaline, the base semi-whitish, yet the sub-basal area is darkened by brown on the veins and the small crossvein is very distinctly clouded. Squamae white. Halteres fuscous yellowish. Legs black.

Abdomen shining black, the second to fourth segments with a narrowly interrupted, greyish pollinose fascia occupying somewhat more than the basal fourth. Posterior claspers tapering from base, the sides subparallel, the apex laterally compressed so as to form an oval knob from lateral view. Outer claspers stout, sub-triangular, one and one-half times as long as wide, their sides slightly convex, not acute at apex and with small straight spine. From one to three pairs of discals on second and third segments.

♀. Front three times as wide as length of second antennal segment, normally wholly pollinose, the apex of second and narrow base of third antennal segments reddish. Mesonotum more densely pollinose, leaving five or six darker, wider vittae.

---

[3] Ent. News, XXXV, 214, 1924.

*Holotype*—♂, Cranbrook, British Columbia, May 9, 1922 (C. B. D. Garrett); No. 79, in the Canadian National Collection, Ottawa.

*Allotype*—♀, Okanagan Falls, British Columbia, April 24, 1919 (E. R. Buckell).

*Paratypes*—♂, Cranbrook, May 8, 2 ♂, May 10, 2♂, May 11, 1922 (Garrett); ♂, Penticton, British Columbia, May 10, 1919 (Buckell); ♀, Victoria, British Columbia, May 10, 1916 (R. C. Treherne).

This species is not separable from the genus *Ernestia*, notwithstanding the hairy face and wide parafacials. The genitalia are essentially the same. According to Tothill's key, the species belongs in the sub-genus *Faustia*, but I have no specimens of that genus for comparison. It apparently differs from *Faustia* in the hairy parafacials. However, in some specimens the hair is greatly reduced and is almost wanting in one.

**Mericia triangularis** n. sp.

Very similar to *M. aldrichi* Toth., but the front is wider and the long genital carina is flat, not acute on the posterior surface and the apex of the posterior claspers is not strongly curved; the carina is larger than in *nigropalpis* Toth., and the palpi reddish. Length, 9:5 mm.

♂. Front a little wider than the length of second antennal segment. Head silvery greyish pollinose. Antennae black; the apex of the second joint more or less reddish; third joint almost one and one-half times as long as second, not unusually wide. Arista black, thickened on basal half. Palpi reddish, their base brown.

Mesonotum thinly greyish pollinose, with five incomplete darker vittae; thorax bluish black in ground color. Scutellum scarcely reddish above. Several black hairs below inner base of squamae.

Wings greyish hyaline, the base slightly darkened. Squamae white, halteres blackish, with reddish base. Legs black.

Abdomen blue-black, the second to fourth segments thinly greyish pollinose, except a broadly interrupted apical fascia. Carina of posterior clasper long, triangular, the caudal surface flat, with just an indication of a sulcus at apex which is slightly widened. The outer claspers are not half as wide on apical as basal half, the apical portion very slightly tapering,

terminating in a long slender hook. Second and third segments each with one pair of discals.

*Holotype*—♂, Aweme, Manitoba, May 24, 1920 (P. N. Vroom); No. 799, in the Canadian National Collection, Ottawa.

**Mericia alberta** n. sp.

Similar to M. *ampelus* Walk., but the carina is longer on caudal edge, the outer claspers are very much wider, scarcely tapering on the apical half, the front distinctly wider and the genital segments normally black, the ♀ without red on abdomen. Length, 10 to 11 mm.

♂. Front as wide as length of second antennal segment. Head silvery grey pollinose. Antennae black, the third joint one and one-quarter times as long as second, its apex somewhat oblique, the upper corner being rounded off; arista black, tapering from base of ultimate section. Palpi reddish, moderately broad throughout.

Thorax shining blue-black, the dorsum with five broad grey pollinose vittae. Scutellum reddish with dark base and sides. Several strong black hairs below inner corner of squamae.

Wings cinereous hyaline, the veins bordered with brownish. Squamae white. Halteres fuscous with paler knob and base.

Abdomen bluish black, the second to fourth segments greyish pollinose except on apical fourth. Genitalia as described above. Second and third segments with one pair of discals, the latter perhaps with a weaker pair in addition as one bristle is present.

♀. Front not twice as wide as length of second antennal joint. Apical half of second antennal joint reddish.

*Holotype*—♂, Banff, Alberta, June 30, 1922 (6,000 ft.), (C. B. D. Garrett); No. 698, in the Canadian National Collection, Ottawa.

*Allotype*—♀, same locality, August 16, 1922 (Garrett).

**Mericia fasciventris** n. sp.

Front slightly over twice as wide, the parafacials as wide as length of second antennal segment; posterior claspers with triangular carina, gently concave behind and slightly beak-like on lower apex; outer claspers very wide on basal half, the apical half with slender almost parallel sides and a small curved apical hook. Female with the second antennal joint reddish, the apical third of the terminal abdominal segment similar in color. Length, 10 to 11 mm.

♂. Front twice as wide as length of second antennal segment. Head silvery greyish pollinose, including the broad blackish frontal vitta in certain lights; face reddish except on parafacials laterally and lower portion of cheeks. Antennae black, the apex of the second and base of third joint more or less reddish; third joint rather large, one and one-half times as long as the second. Palpi reddish with brown base.

Mesonotum greyish pollinose, leaving three wide black vittae, the median one of which is narrowly interrupted on much of its length by a slender pollinose vitta. Thorax shining black in ground color. Scutellum black, the apical half, or more, more or less clearly reddish, the whole greyish pollinose. Several conspicuous black hairs below the inner end of the squamae. Wings cinereous hyaline, the veins narrowly brownish. Squamae white. Halteres fuscous, with reddish base. Legs black.

Abdomen shining black, with more than the basal half of each segment greyish pollinose. Genitalia as described above. One pair of discals on second and third segments.

♀. Front two and one-half times as wide as length of second antennal segment. First two antennal joints reddish. Apical third or less of terminal abdominal segment reddish or obscurely so.

*Holotype*—♂, Aylmer, Quebec, June 1, 1923 (C. H. Curran); No. 797, in the Canadian National Collection, Ottawa.

*Allotype*—♀, Ottawa, Ontario (Mer Bleu), June 7, 1923 (A. Richardson).

*Paratypes*—♂, Chelsea, Quebec, May 30, 1923 (Richardson); ♂, Vernon, British Columbia, May 24, 1918 (W. Downes); ♀, Aweme, Manitoba, June 3, 1920 (P. Vroom).

The female is distinguished from *ampelus* Walker by the broad black base of the terminal abdominal segment. The male has the carina on the posterior claspers much as in *nigropalpis* Toth., but more pointed and the outer claspers are narrow on apical half, much as in *arcuata* Toth. Both these species have a narrow front. The carina in *aldrichi* Toth. and *longicarina* Toth. is much longer than in *fasciventris*, of different shape, and the outer claspers are quite different.

**Mericia campestris** n. sp.

Allied to *M. arcuata* Tothill, but readily distinguished by the much broader outer claspers as they taper slightly from the middle to the apex, instead of being narrow on apical half, and the carina on the posterior forceps is less concave. Length, 11 mm.

♂. Head silvery greyish white pollinose with a yellowish tinge in certain lights. Antennae blackish, the apex of the second and base of the third, except above, reddish; third joint one-fourth longer than second; arista brown, vibrissae situated above the anterior oral tip a distance equal to two-thirds the length of the second antennal segment; palpi reddish. Eyes separated by not over half the length of the second antennal joint.

Mesonotum black, the lateral margin and obscure sub-dorsal vittae greyish pollinose: Scutellum reddish with narrow black base and sides.

Legs black. Wings lightly infuscated. Squamae white, halteres fuscous with part of knob and base reddish. Several fine pale brownish hairs beneath inner end of squamae.

Abdomen black, the third to fifth segments reddish on the broad sides, except the narrow apex of each; abdomen thinly greyish pollinose, the apices of the segments darker, the pollen appearing somewhat tessellate in certain views. Carina of posterior forceps long, triangular, its short end somewhat concave, the apex not at all flattened or widened; the outer forceps wholly broad, still broadened at the middle and narrowed to the acute apex which bears a short, curved hook. One pair of discals on second and third segments.

*Holotype*—♂, Aweme, Manitoba, May 20, 1920 (P. N. Vroom); No. 795, in the Canadian National Collection, Ottawa.

*Paratype*—♂, Aweme, May 28, 1921 (H. A. Robertson).

## A New Species of Ant from Kansas (Hym.: Formicidae).

By M. R. Smith, A. and M. College, Mississippi.

The writer has recently received a species of ant from Kansas, which appears to be new. The ants which belong to the genus *Pheidole* were found attacking the seed of sorghum at Manhattan, Kansas, by Professor W. P. Hayes. At a superficial glance one would be inclined to assign them to the species *vinelandica,* but a more careful study will bring out certain characters which are certainly distinct from those of *vinelandica,* The more important differences in the two are given in this paper. Because of the fact that this ant is apparently new and

also because of the fact that it has shown some tendency to become an economic pest in Kansas, the writer has drawn up the following description of this ant and named it *hayesi*, in honor of Professor Hayes, its collector.

**Pheidole hayesi** sp. nov.

*Soldier.* Length: 2.5 mm-3 mm.

Head, excluding mandibles, somewhat longer than broad, about as broad behind as in front, with distinctly excised posterior border, a faint, yet definite, occipital furrow and prominently rounded angular lobes; sides sub-convex to convex. Eyes small, oval, slightly convex, considerably less than one-third the distance from the anterior to the posterior corners of the head. Mandibles not strongly convex, with two prominent apical and usually one or more small basal teeth. Clypeus flattened, smooth throughout, with a pronounced excision in the anterior border, the two edges of the excision forming angulate teeth. Antennal scapes reaching to about the middle of the head, slender, distinctly curved at the base. Club as long as, or longer than, the rest of the funiculus. Frontal area triangular, impressed. Mesonotum when viewed in profile appears flattened dorsally and angulate posteriorly. Meso-epinotal constriction deep, well pronounced. Epinotum with the base as long as, or longer than, the declivity, the former broadly grooved dorsally. The spines short, coarse, the tips reflexed outward and downward. Petiole longer than broad, the sides concave. Node flattened above or with a faint excision. Postpetiole less than twice as broad as the petiole, the sides angulate or conulate. Gaster smaller than the head, subspherical.

Mandibles shining, sparsely punctate and longitudinally striated basally. Clypeus, frontal area, and the posterior half of the head smooth and shining, the latter very noticeably so. Anterior half of the head subopaque, longitudinally striated, the striations in the regions of the eyes more parallel and well defined than elsewhere. Thorax anteriorly and laterally rugulose and subopaque; the dorsal surfaces of the pronotum and mesonotum somewhat smooth and shining. The petiole laterally and ventrally punctulate, subopaque. Postpetiole, dorsally, smooth and shining. Gaster polished and shining.

Hairs pale yellowish; rather coarse, sub-erect on head, antennae and legs, longer, more erect and of unequal length on thorax, petiole, postpetiole and gaster.

Ferruginous brown; legs lighter and more yellowish, gaster dark brown.

*Worker.* Length: 1.5 mm-2 mm.

Head, excluding the mandibles, about as broad as long, with convex sides and a faint emargination of the posterior border. Eyes barely anterior to the middle of the sides of the head. Mandibles with two definite apical and several small, irregular, basal teeth. Clypeus smooth, with straight, entire, anterior border. Antennal scapes reaching almost to the posterior corners of the head. Frontal carinae short. Frontal area well pronounced, sub-triangular, free from ridges. Thorax somewhat similar to that of the soldier but lacking the angular humeri. Petiole as in the soldier. Postpetiole less than twice as broad as the petiole, with the sides only faintly or slightly angular but not conulate as in the soldier. Gaster smaller than the head. Femora and tibiae of legs well developed.

Head with the exception of the antennae and cheeks distinctly shining, cheeks and antennae subopaque, the former with longitudinal rugae. Dorsal surface of the pronotum and the mesonotum smooth and shining. Epinotum and the pleurae of the mesonotum punctulate, opaque. Petiole and postpetiole smooth and shining dorsally, the sides subopaque. Gaster smooth and shining.

Hairs of the same color as in the soldier, over all portions of the body, numerous and erect on the scapes and funiculi of the antennae.

Dark brown, almost black, mouth parts and appendages lighter.

Described from eleven soldiers and five workers, all of which are in the writer's collection. These specimens were sent to the writer by Professor W. P. Hayes of the Entomology Department of the Kansas State Agricultural College, Manhattan, Kansas.

Professor Hayes found this species attacking sorghum seed at Manhattan. In a letter to the writer, he stated: "They construct small earthen mounds from one and three-fourths to two inches in diameter and often carry small bits of the attacked seed to the surface, where it is scattered over the mound." Because of this seed-eating habit this ant is assuming the role of an economic pest.

After a very careful study of this species the writer feels convinced that *hayesi* is more closely related to *Pheidole vinelandica* than to any other ant of this group. Not only is this true of the general size and shape of the ant, but it is also true of its

habits. The two species are so closely related that a further study of more specimens of *hayesi* from various localities may result in *hayesi* being given subspecific rank. The sides of the head in *hayesi* are more convex than those of *vinelandica,* the posterior angles of the head of the former are more angulate than are the corners of the head of *vinelandica,* which are very broadly rounded. The thorax of *hayesi* is anteriorly and laterally rugulose, the thorax of *vinelandica* is distinctly punctulate on the sides of the mesonotum and epinotum, and particularly on the dorsal surface of the epinotum. There are also other differences of minor importance. The shape of the head and the sculpture of the thorax are the two most outstanding differences in the two.

## Handy Collecting Apparatus.

By William E. Hoffmann, Division of Entomology, University of Minnesota.

During the past season the writer found a large number of *Microvelia hinei* Drake and set about to get as many as possible. After an hour and more of real effort the catch was counted and found to number but a dozen. This was a real disappointment as this species had not been found in such numbers before and a large series was desired. The specimens for the most part were on the surface of water only one or two inches deep. A few of them were found on the mud at the edge of the water and many more of them ran from the water to the flat mud bank when disturbed. They are unlike *M. borealis* Bueno or *M. americana* Uhler in this respect, for these species will run out upon the water when disturbed. The *M. hinei* were found in a rather restricted area on this small pond, a strip some twelve or more feet in length. They were seldom found more than three feet from the water's edge. There was a dense growth of *Typha* here and because of this and also because of the shallow water, an ordinary water net was of little use. The collecting was given up for the day with the firm conviction that some better means of collecting must be devised to take this species in numbers.

The next morning while washing dishes in our combination kitchen and laboratory, the feasibility of using a large spoon for collecting, presented itself. Accordingly, a large spoon was selected from the culinary equipment and a hole three-quarters of an inch in diameter was made in the center of it. A piece of curtain scrim, the same as used for making insect nets, was fastened over the hole by means of strips of adhesive tape. That afternoon the pond was visited again and the new piece of apparatus given a trial. The results exceeded the most optimistic expectations. It was a simple matter to dip up the water upon which the *Microvelia* stood as the surface tension of the water offered but slight resistance to the dipping of the spoon. The scrim permitted the surplus water to pass through with a film of water remaining on the surface of the spoon sufficient to force the bugs into the live bottle when the spoon was upturned. Since *Microvelia* are mounted to better advantage if not killed until a few minutes before one wishes to mount them, it is desirable to keep them alive until they are to be mounted. They may be placed in folds of damp cheese cloth, but as this is a slow and cumbersome method at best, it was decided to use a live bottle. The live bottle, however, soon became partly filled with water and had to be drained occasionally to prevent the bugs becoming water-logged. This difficulty was remedied before the next day's collecting trip by placing the bottle on an emery wheel and grinding a small hole in the bottom of it. This hole was covered with scrim in the same manner as the hole in the spoon.

In addition to *Microvelia hinei* Drake, *M. borealis* Bueno, *M. albonotata* Champion, *M. buenoi* Drake, and *M. fontinalis* Bueno, nymphs and adults, were successfully collected with this apparatus. Often three or four were taken at a time. Only the nymphs of *M. americana* Uhler could be taken in this manner as the agile adults would soon swim beyond reach. The spoon works best in shallow water and especially if there is a great deal of vegetation or drift present. Late in the fall a pond was found which was drying up and only a small pool surrounded by barren mud banks remained. Here *Gerris* nymphs

and adults, *Notonecta* nymphs and adults, and adult *Buenoa, Plea,* Corixids, Hebrids, and *Microvelia,* as well as Hydrophilid, Dytiscid and Haliplid beetles were taken. This pool was so shallow that it was impossible to collect with an insect net.

The adhesive tape held securely for several months in spite of almost daily soaking in water. The spoon, however, may be made more permanent with but very little trouble, by soldering on a piece of wire gauze in the place of the scrim. This apparatus commends itself for use not only because it enables the collector to take certain forms with more facility, but because it is cheap and easy to make and not burdensome to carry.

**Note on Hydnobius matthewsii Crotch. (Col.: Silphidae).**

On the morning of November 7, 1922, being then in Lassen County at an elevation of 6,500 feet, I awakened to find the ground covered by a fall of three feet of damp snow and just outside my cabin door, on the surface of the snow, took numerous specimens of two species of beetles. The first and most numerous was *Aphodius nevadensis* Horn. The second was an undoubted Silphid but would not fit into any of the tribes in Horn's Synopsis of the Silphidae in Trans. Am. Ent. Soc. VIII, 1880. Its characters, especially those of the antennae indicated the genus *Hydnobius,* but the fact that its anterior coxal cavities were open behind threw it out of the tribe Anistomini to which that genus belongs. Comparison with the description of *Hydnobius matthewsii,* by Crotch, showed it to be undoubtedly that species, and this determination was confirmed by Mr. H. C. Fall, to whom I sent specimens. On page 278 of the above cited paper, speaking of the genus *Dietta,* Horn says, "The side piece (epimeron) of the prothorax produced behind the coxae, but extremely slender, so as to be only a spine—the two not meeting in the middle," is I suspect, one of those cases in which the eyes have been deceived, as all the Anisotomini have the anterior coxae closed behind by the epimera, a fact which is sometimes demonstrable only by the separation of the thorax from the body. I have separated the thorax from the body in four specimens and find in each case a fairly wide separation of these sclerites. As *matthewsii* is the only *Hydnobius* in my collection I am unable to note as to its truth for other members of the genus. The specimens of which I took about fifty were all found within an eighth of a mile radius and outside of that limit I could find no others.—J. O. MARTIN, Berkeley, California.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JULY, 1924.


## Duty on Insects Again.

In this Journal* for last October we published a brief article on the question of the importation of insects by institutions and individuals and stated the Government regulations covering such matters.

Our article was suggested by a number of complaints from entomologists and our own unpleasant experiences. Different methods and different rates were charged in other places and in some insects came in free of duty.

We suggested that the U. S. Bureau of Entomology try to clarify the atmosphere and Dr. L. O. Howard, Chief of the Bureau, took a warm interest in the subject and said he would do all he could in relation thereto. It is, however, a matter for Congress. It may be that the cause of the trouble is the fact that there are quite a number of dealers in insects who sell them solely for art and decorative purposes.

Mr. J. R. de la Torre-Bueno, Editor of the Bulletin of the Brooklyn Entomological Society, sends the following: "Regarding duty on imported insects, while it may be true that it cannot be taken up with this session of Congress, I think it is time the entomological journals throughout the country ventilated the matter thoroughly so that when the proper time comes we may be ready to present a memorial to Congress on the subject, which memorial might well be presented and passed at the Washington meeting of the Entomological Society of America this year. It might also be well, if at the proper time, entomologists throughout the country addressed to their representatives in Congress an identical letter on the subject."

HENRY SKINNER.

*Ent. News, 1923, XXXIV, p. 244.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of The American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **8**—The Entomologist's Monthly Magazine, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **19**—Bulletin of the Brooklyn Entomological Society. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **49**—Entomologische Mitteilungen, Berlin-Dahlem. **50**—Proceedings of the United States National Museum. **52**—Zoologischer Anzeiger, Leipzig. **57**—Biologisches Zentralblatt, Leipzig. **68**—Science, Garrison on the Hudson, N. Y. **72**—The Annals of Applied Biology, London. **76**—Nature, London. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **78**—Bulletin Biologique de la France et de la Belgique, Paris. **80**—Revue Suisse de Zoologie, Geneve. **85**—The Journal of Experimental Zoology, Philadelphia. **93**—Bulletin, Division of the Natural History Survey, Urbana, Ill. **101**—Journal of The Linnean Society of London. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **107**—Rivista del Museo de la Plata, Buenos Aires. **116**—Entomologische Zeitschrift, Frankfurt A. M. **120**—Annalen des Naturhistorischen Museums in Wien. **124**—Bulletin de la Societe entomologique d'Egypte, Cairo. **138**—American Museum Novitates, New York. **139**—Bulletin of the Southern California Academy of Sciences, Los Angeles. **141**—Internationale Entomologische Zeitschrift, Guben. **157**—Abhandlungen der Zool.-Botan. Gesellschaft in Wien.

**GENERAL. Bather, F. A.**—The meaning of the terms "Binary" and "Binominal" as applied to biological nomenclature. **101**, xxxvi, 29-35. **Bruch, C.**—Estudios mirmecolo-

gicos. Con la descripcion de nuevas especies de dipteros (Phoridae) por los H. Schmitz, y Th. Borgmeier y de una aranea (Gonyleptidae) por el Dr. Mello-Leitao. **107,** xxvii, 172-220. **Campion, H.**—Obituary. **8,** 1924, 69. **Cragg, F. W.**—Obituary of. **76,** cxiii, 720-21. **Davis, J. J.**—Relation of insects to human life and to the sciences. (Proc. Indiana Ac. Sc., xxxiii, 287-97.) **Dingler, M.** — Insektenkasten mit glasboden. **141,** xviii, 18-9. **Ochs, G.**—Wissenschaftliche ziele in der entomologie und spezialisierung. **116,** xxxviii, 5-6. **Parshley, H. M.**—Latter-day horismology: A review. **19,** xix, 95-99. **Robertson, C.**—Flower visits of insects, II. **5,** xxxi, 93-111. **Torre-Bueno, J. R.**—On "N. Sp." (Editorial.) **19,** xix, 99. **Trotter, A. P.**—The language (if any) of insects. **76,** cxiii, 747. **Zukowsky, B.**—Wie ist zu sammeln. **141,** xviii, 27-30 (Cont.).

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC. Butschli, O.**—Vorlesungen ueber vergleichende anatomie, Lief. 4, Ernahrungsorgane. Berlin. 380 pp. **Eidmann, H.**—Untersuchungen ueber die morphologie und physiologie des kaumagens von Periplaneta orientalis. **104,** cxxii, 281-307. **Ford, N.**—A comparative study of the abdominal musculature of orthopteroid insects. (Trans. R. Canada. Inst., xiv, 207-320.) **Haldane, J. B. S.**—The possible existence of a growth-regulating substance in termites. **76,** cxiii, 676. **Hanstrom, B.**—Ueber die histologie und vergleichende anatomie der sehganglien und globuli der araneen. (K. Svenska Vet.-Akad. Handl., lxi, No. 12.) **Hecht, O.**—Embryonalenwicklung und symbiose bei Camponotus ligniperda. **104,** cxxii, 173-204. **Heller, J.**—Sur la transformation des matieres albuminoides pendant la metamorphose des lepidoptere, Deilephila euphorbiae. **77,** xc, 1360-1. **Hoffman, W. A.**—The presence of an eversible gland in a midge. **10,** xxvi, 144. **MacGillivray, A. D.**—Crampton on the labium of certain Holometabola. **10,** xxvi, 133-41. **Minnich, D. E.**—The olfactory sense of the cabbage butterfly, Pieris rapae, an experimental study. **85,** xxxix, 339-56.

**ARACHNIDA AND MYRIOPODA.**

***Hirst, S.**—On a new mite of the genus Chorioptes parasitic on goats in the U. S. **11,** xiii, 538. ***Jacot, A. P.**—Oribatid mites: Euphthiracarus depressculus and E. flavus. (Tr. Amer. Micro. Soc., xliii, 90-6.)

**THE SMALLER ORDERS OF INSECTA. Dodds, G. S.**—Ecological studies of aquatic insects. Adaptations of

mayfly nymphs to swift streams. (Ecology, v, 137.48.) **Willem, V.**—Observations sur "Machilis maritima." **78**, lviii, 306-20. **Withycombe, C. L.**—Note on the economic value of the N., with special reference to the Coniopterygidae. **72**, xi, 112-25.

**Calvert, P. P.**—The generic characters and the species of Philogenia (Odonata). **2**, 1, 1-56. **Dietz, H. F.**—Notes on the Termites of Indiana. (Proc. Indiana Ac. Sc., xxxiii, 299-301.) ***Hood, J. D.**—A new Ankothrips from New Mexico. (Thysanoptera.) **19**, xix, 66-8. **Lestage, J. A.**—Atalophlebia brieni sp. n. ephemere nouvelle du Bresil. **33**, lxiv, 21-4. ***McDunnough, J.**—New Canadian Ephemeridae with notes, II. **4**, lvi, 90-89 (Cont.). **Snyder, T. E.**—Description of a new termite from Porto Rico. **10**, xxvi, 131-2. Descriptions of n. sps. and hitherto unknown castes of termites from America and Hawaii. **50**, lxiv, Art. 6. ***Treherne, R. C.**—Thysanoptera known to occur in Canada. **4**, lvi, 82-8.

**ORTHOPTERA. Morgan, W. P.**—Notes on the function of the forceps of earwigs. (Proc. Indiana Ac. Sc., xxxiii, 303-6.)

**HEMIPTERA. Hase, A.**—Ueber die stiche der wasserwanze Notonecta glauca. **52**, lix, 143-55. **Poisson, R.**—Recherches sur le polymorphisme alaire chez les Hemipteres aquatiques. **78**, lviii, 205-305.

***Barber, H. G.**—Two new sps. of Cymus. (Lygaeidae.) **19**, xix, 87-90. **Drake, C. J.**—A new sp. of Acanthocheila from Bolivia (Tingitidae). **19**, xix, 94. **Knight, H. H.**—Atractotomus mali found in Nova Scotia. (Miridae.) **19**, xix, 65. ***McAtee, W. L.**—Notes on a collection of Erythroneura and Hymetta chiefly from Illinois, with descriptions of new forms. (Eupterygidae.) **93**, xv, 39-44. ***McAtee & Malloch**—Some annectant bugs of the superfamily Cimicoideae. **19**, xix, 69-83. **Ribaut, H.**—Etude sur le genre Triphleps (Anthocoridae). (Bul. Soc. Hist. Nat. Toulouse, li, 522-38.) **De la Torre-Bueno, J. R.**—A correction in Acalypta (Tingididae). **19**, xix, 93.

**LEPIDOPTERA. Bell, E. L.**—A new locality for Pamphila meskei. **19**, xix, 86. **Emeljanoff, N.**—Intersexualitat bei Lymantria dispar, unter einwirkung der temperatur. **57**, xliv, 106-10. **Grandi, G.**—Studi sullo sviluppo postembrionale delle varie razze del Bombyx mori. (An. R. Sc. Sup. Agri. Portici, xviii, 72 pp.)

***Comstock, J. A.**—Studies in Pacific coast L. **139,** xxiii, 51-2. **Mousley, H.**—Further notes on the Rhopalocera or butterflies of Hartley, Stanstead County, Quebec, 1923. (Can. Field-Nat., xxxviii, 82-3.) **Oberthur, C.**—Etudes de lepidopterologie comparee, Fasc. xxii. Le Genre Agrias, 11 col. pls. **Schaus, W.**—New sps. of Pyralidae of the subfamily Nymphulinae from tropical America. **10,** xxvi, 93-130.

**DIPTERA. Aldrich, J. M.**—On the nomenclature in Diptera. **10,** xxvi, 146. **Brolemann, H. W.**—L'hypopygium de Pachyrhina pyrenaica. (Bul. Soc. Hist. Nat., Toulouse, li, 472-521.) **Brues, C. T.**—Another "snow" phorid. **5,** xxxi, 92. **Campbell & Davidson** — Notes on aphidophagous Syrphidae of southern California. **139,** xxiii, 59-71. **Greene, C. T.**—The collection of immature stages of Diptera in the National museum (exclusive of Culicidae). **10,** xxvi, 146. **Gruhl, K.**—Paarungsgewohnheiten der dipteren. **104,** cxxii, 205-80. **Hearle, E.**—La lutte contre les moustiques a Banff, Alberta. (Le Natur. Canadien, l, 210-13.) **Shannon, R. J.**—Notes on the maxillary teeth of Anopheles. **10,** xxvi, 142-3. **Worthley, H. N.**—The biology of Trichopoda pennipes, a parasite of the common squash bug. (Tachinidae.) **5,** xxxi, 57-77.

***Alexander, C. P.**—The crane-flies of New York: Second supplementary list. **19,** xix, 57-64. **Bruch, C.**—(See under General.) ***Dunn & Parker**—Fleas found on wild animals in Bitterroot Valley, Montana. (U. S. Pub. Health Serv., Reprint. No. 883.) ***Johannsen, O. A.**—A new chloropid subgenus and sp. from New York. **4,** lvi, 89. ***Melander, A. L.**—Review of the dipterous family Piophilidae. **5,** xxxi, 78-86. ***Melander & Argo**—A revision of the two-winged flies of the family Clusiidae. **50,** lxiv, Art. 11. **Shannon, H. C.**—Some common flies little known in Maine. **10,** xxvi, 146. ***Shannon & Dobroscky**—The No. American bird parasites of the genus Protocalliphora. (Jour. Wash. Ac. Sc., xiv, 247-53.)

**COLEOPTERA. Altson, A. M.**—On the genital system of Lyctus brunneus, with a note on L. linearis. **101,** xxxv, 581-98. **v. Lengerken, H.**—Kopftransplantation an Coleopteren. **52,** lix, 166-70.

**Bruch, C.**—(See under General.) **Cotton, R. T.**—The identity of Sitophilus (Calandra) rugicollis. **10,** xxvi, 141. **Dobzhansky, T.**—Die weiblichen generationsorgane der Coccineliden als artmerkmal betrachtet. **49,** xiii, 18-27.

**De la Escalera, M. M.**—Enumeracion de las espanolas de Dorcadion (Cerambycidae) del museo de Madrid, y descripcion de algunas formas nuevas. (Bol. R. Soc. Espanola Nat. Hist., xxiv, 191-200.) **Gibson, A.**—The occurrence of the ptinid beetle, Niptus hololeucus, in No. Am. **4,** lvi, 74-6. **Holdhaus, K.**—Das Tyrrhenisproblem. Zoogeog. untersuchungen unter besonderer berucksichtgung der koleopteren. **120,** xxxvii, 1-200. ***Knisch, A.**—Zwei neue nearktische Palpicornier (Hydrophilidae.) **124,** iv, 55-6. **Reichensperger, A.**—Neue sudamerikanische Histeriden als gaste von wanderameisen und Termiten. **80,** xxxi, 117-52.

HYMENOPTERA. **Davis, W. T.**—Oak apple galls destroyed by squirrels. **19,** xix, 91-3. **Wheeler & Wheeler**—The use of a tool by a sphecid wasp. **68,** lix, 486.

**Bruch, C.**—(See under General.) ***Cockerell, T. D. A.**—New anthophorid bees from Arizona and Wyoming. **138,** No. 113. ***Cushman, R. A.**—On the genera of the ichneumon-flies of the tribe Paniscini, with descriptions and discussion of related genera and sps. **50,** lxiv, Art. 20. **Enslin, E.**—Die blattwespengattung Tenthredo (Tenthredella.) **157,** xi, 1-96. **Santschi, F.**—Nouvelles fourmis Bresiliennes. **33,** lxiv, 1-20.

---

## SPECIAL NOTICES.

**Les insectes parasites de l'homme et des animaux domestiques** par E. Seguy. Paul Lechevalier, Paris, 1924, 422 pp., 463 fig. This small octavo book is part xviii of the Encyclopedie Pratique du Naturaliste. Judging from the text, illustrations and the bibliography, it will be a very useful addition to the library of a student of this branch of entomology.

**The Macrolepidoptera of the World.** Fauna americana, pts. 136 to 141, include the family Hesperiidae, genera Erynnis to Thracides, by M. Draudt; and Nymphalidae, genera Halisidota to Hemihyalea, by A. Seitz.

**Memorias de la Sociedad entomologica de Espana.** We are glad to announce the appearance of the first number of this new serial. It contains one article by R. P. Longinos Navas, entitled Sinopsis de los Paraneuropteros (Odonatos) de la peninsula oberica, 68 pages, with some text figures.

**The Naturalists' Directory,** containing names, addresses and special subjects of study of professional and amateur naturalists of the United States and Canada. Samuel E. Cassino, Salem, Mass. $5.00. Published April, 1924.

ETUDES DE LEPIDOPTEROLOGIE COMPAREE par CHARLES OBERTHUR. Fascicule XXII, part I. Rennes, France. Imprimerie Oberthür, April, 1924. This part is dedicated to Jules Culot for his incomparable talent as an artist and Lepidopterist. Mr. Harold Powell has in this part, an interesting article on the migration flights of the Lepidoptera. The larger part of the number is taken up with the Nymphalid genus *Agrias*. This important paper by Mr. Oberthür comprises seventy-three pages of text, eleven plates and thirty-three figures in color and one half-tone plate with two figures. The colored plates by J. Culot are works of art and also true to nature. Mr. Oberthür has added immensely to our understanding of these lovely butterflies. There are not many species, but the species break up into a number of topomorphic forms. Some of them are a riot of beautiful colors—brown-black, blue, red, yellow, orange and green. The author gives a historical account of the genus and treats the literature in detail.—HENRY SKINNER.

## OBITUARY.

LOUIS ALBERT PERINGUEY, whose name usually appeared as L. Peringuey, died February 20, 1924. He was of French descent. An obituary notice in *Nature* (London) for April 12th gives little information as to details of his life other than he had been connected with the South African Museum at Cape Town, since 1884, becoming Assistant Director under Mr. W. L. Sclater, and Director in 1905, a position held to his death. He had been general secretary of the Royal Society of South Africa and was president thereof from 1914 to 1918. He wrote extensively on South African Coleoptera—his chief work being a *Descriptive Catalogue of the South African Coleoptera*, 1893-98, which appeared in volumes 7 and 10 of the *Transactions of the South African Philosophical Society*. He published also on South African Mutillidae and Orthoptera, one of his latest entomological papers being on this last-named group in the *Annals of the South African Museum* (volume 15, 1916). In non-entomological fields he was the author of *The Stone Age in South Africa*.

---

*Science* for May 16, 1924, states: "Major FRANCIS WILLIAM CRAGG, the well-known entomological expert, who had been investigating typhus and relapsing fevers, recently left

Kassauli for Lahore, where typhus is prevalent, in order to study the disease. He contracted the disease himself and died on April 23. For some time past Major Cragg had been assistant director of the Central Research Institute at Kassauli." With Capt. Walter Scott Patton, Major Cragg was co-author of the well and favorably known *Text Book of Medical Entomology,* published by the Christian Literature Society for India in 1913. He was an M. D. of the University of Edinburgh.

---

ARTHUR HUGH JONES, English lepidopterist, highly esteemed for his personal qualities, but who wrote little, died February 22, 1924, at Church Gate House, Wadhurst, Sussex. He was in the banking house of Drummond, was treasurer of the Second Entomological Congress at Oxford, 1912, and of the Entomological Society of London, 1904-17, and a vice-president of the Society in 1912 and 1918.

---

ARTHUR LESTER LOVETT, Professor of Entomology, Oregon Agricultural College, and Oregon State Entomologist, died at his home in Corvallis, Oregon, Friday, April 25, 1924, of septicaemia poison.

Born at Neal, Kansas, August 23, 1885, he was called from us in the prime of life and at the time he was attaining national recognition as a leader among economic entomologists. Graduated from Oklahoma Agricultural and Mechanical College in 1906, Prof. Lovett acted as Entomologist for that institution and as state inspector until 1911, when he came to the Oregon Agricultural College as Assistant Entomologist. In 1917 he became head of the department of Entomology and State Entomologist for Oregon.

He paid much attention to the Diptera, especially the family Syrphidae, in which group he has described many new species from the west. During the past few years, however, little time was devoted to systematic entomology, but his untiring labor along economic lines brought him wide recognition among the fruit growers and farmers of the Northwest. Prof. Lovett was the first to use spreaders for increasing the efficiency of sprays; this practice is now common throughout the country.

Professor Lovett's untiring labor in the field of science, his winning personality and upright character won for him a legion of friends who mourn deeply his untimely end. The Institution, the State, and the scientific world have lost a loyal worker, a true friend and a man whose place will not soon be filled.

Prof. Lovett was a fellow of the American Association for the Advancement of Science and had been a Vice-President of the American Association of Economic Entomologists and a member of the Editorial Board of the Annals of the Entomological Society of America. He was a member of the California Academy of Science, Pacific Slope Entomological Society, Western Society of Naturalists, Crop Pest Institute of America, the American Crop Pest Commission and of two National Honorary Fraternities, Gamma Sigma Delta and Phi Kappa Phi.

He is survived by a widow and two children, his parents, Mr. and Mrs. H. W. Lovett, of Fort Collins, Colorado, a brother, A. E. Lovett, of Yakima, Washington, and a sister, Mrs. P. N. Annand, San Mateo, California.

W. J. CHAMBERLIN.

---

THOMAS NELSON ANNANDALE, D. Sc., F. R. S., Director of the Zoological Survey of India since 1916, died in Calcutta, April 10, 1924. He was born at Edinburgh in 1876, was educated at Rugby, Edinburgh University and Balliol College, Oxford, at which last he took his B. A. degree. He traveled in the Malay Peninsula in 1899, 1901-02 and 1916, and investigated the fauna of the Sea of Galilee in 1912. He joined the Service in India in July, 1904, as Deputy Superintendent of the Zoological and Anthropological Section in Bengal, and in 1906 became Superintendent of the Indian Museum, editing the *Records* and the *Annals* of the Museum since their inception in 1907. His writings, on various groups of invertebrates, include some notes on Indian species of the Dipterous genus *Phlebotomus* in volume IV of these *Records* (1910, 1911).

Dr. Annandale was very active in developing knowledge of the fauna of India by enlisting the aid of specialists to study the collections of the Indian Museum. A number of entomologists, including Americans, were among those to whom he successfully appealed.

Herbert Campion, Temporary Assistant in the Entomological Department of the British Museum (Natural History) since 1921, died on January 24, 1924. He was born at 155 Sloane Street, London, S. W., England, on August 2, 1869. Frail physically, he never attended school, but overcame the difficulties and handicaps incident to acquiring an education "by his good brain, patience and great and constant love for his studies, coupled with the assistance and fellow-likings of his brother, Frederick William Campion, throughout his life." He became a shorthand clerk but in 1911 joined the newly established Imperial Bureau of Entomology until 1921, when his transfer to the British Museum occurred.

The two brothers Campion early became interested in the Odonata. Living at Walthamstow, Essex, a northeastern suburb of London, they were but a short distance from Epping Forest, which since 1882 has been "a free and inalienable public park and place of recreation" of about 5500 acres. This was a favorite collecting ground and for the seven years, 1903-1909, they gave an annual paper in *The Entomologist* on *The Dragonflies of Epping Forest,* in the familiar British style, with much local detail, forming a body of data on the distribution of a small number (about 20) species for successive years, which will surely be valuable for comparison with records of similar phenomena in other parts of the world.

In 1909 or 1910, their residence was changed to 58 Ranelagh Road, Ealing London, West, where his brother and sister continued to live after Herbert Campion's death. The series of papers on Epping Forest ceased and was replaced by *Notes on the Dragonfly Seasons* of 1910, 1911, 1912 and 1913 in the same journal, based on a number of varied localities visited by the authors and others. Besides notes on variations of several English species, these collecting years also furnished some of the material for two papers on Larval Water Mites as Dragonfly parasites (1909) and on the Prey of some Dragonflies (1914).

After becoming connected with the Imperial Bureau of Entomology, Herbert Campion's attention was directed to exotic Odonata and we have his articles on these insects from Tunisia,

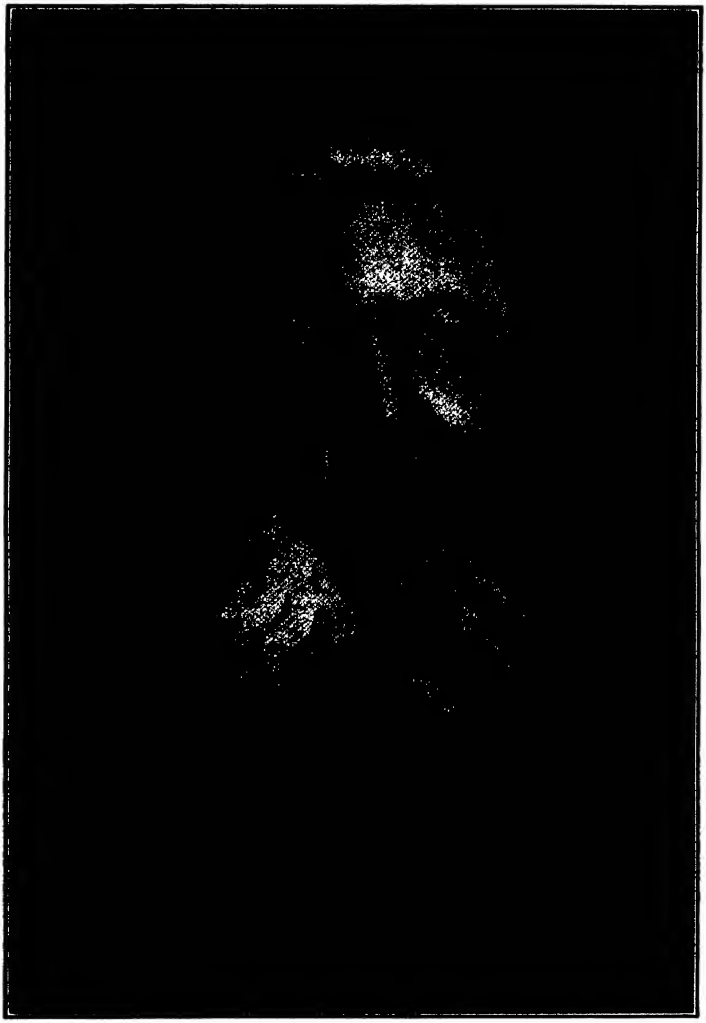
West Africa, Dutch New Guinea, Australia, Macedonia and New Caledonia and on some Gomphines from South America. He also described (1916) a beautifully preserved fossil wing from the English Eocene as *Triaeschna gossi*, and in the following year (1917) published notes on *Fabricius's Types of Odonata in the British Museum*. His morphological paper, *The Antenodal Reticulation of the Wings of Agrionine Dragonflies* was published in the *Proceedings of the Academy of Natural Sciences of Philadelphia* for 1913, the only one to appear first on this side of the Atlantic. In it he came to the conclusion that,

We have evidence of the former existence of at least seven antenodals, of which the second and fourth alone persist in the greater number of recent Agrioninae. In a hypothetical wing, including all the antenodal cross-veins of which indications have so far been afforded by morphology and tetratology, the fourth antenodal is that which coincides with the arculus, and this fact enables one to recognize it in all other Agrionine wings. . . . . In our reconstructed wing, then, we have seven antenodal cross-veins, disposed in the following manner: Nos. 1, 2 and 3 placed before the level of the arculus; No. 4 coinciding more or less exactly with the arculus, and Nos. 5, 6 and 7 lying between the level of the arculus and the nodus.

In the year preceding his death his letters mention his working on East African Odonata and his hopes to describe certain interesting species from the Philippines, as well as the possibility of studying a large consignment from Java. Whether sufficient had been accomplished to permit of publication we do not know.

Mr. Campion was a kind and helpful correspondent and his connections with the British Museum made his assistance very valuable. In more than one case has the writer of these lines had the pleasure of printing acknowledgments of his aid. With keen regret we feel his departure and tender our sincere sympathy to his surviving brother and sister.

[The writer is indebted to Mr. F. W. Campion for the date and place of his brother's birth and for some other data. Some facts have been drawn from two obituaries in *The Entomologist* and in *The Entomologist's Monthly Magazine* for March. The greater part of the above notice, however, is based on Mr. Herbert Campion's published papers and one of his letters.] PHILIP P. CALVERT.



CHARLES OBERTHUR.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV OCTOBER, 1924 No. 8

CONTENTS



## CHARLES OBERTHUR.

(Portrait, Plate VII.)

CHARLES OBERTHUR, President du Conseil d'Administration de la Societe Anonyme des Imprimeries Oberthur, Ancien Maire de Monterfil, Ancien Adjoint au Maire de Rennes, President honoraire de la Chambre de Commerce de Rennes, Membre de la Societe Entomologique de France, Chevalier de la Legion d'honneur, Commander de Saint-Gregoire-le-Grand and a very distinguished Entomologist, died June first at his home 36, faubourg de Paris, Rennes, France.

Monsieur Oberthur was one of the greatest Lepidopterists the world has produced and his death has removed a student who was constantly contributing papers and books of the utmost value to science. He possessed a marvellous collection which ranked among the greatest extant.

He had a profound regard for the value of illustrations and carried this idea out during a long life time, having published

thousands of admirable illustrations by artists of the very highest ability. His studies probably began about 1864 and he published many papers in the various European journals devoted to such subjects, a total of more than fifty up to the year 1900.

In 1876 was commenced the superb work entitled *Etudes d'Entomologie,* with numerous colored figures, describing new and little known Lepidoptera from many parts of the world. This was continued until May, 1896, part XXI, and was kept up in the same sumptuous manner as in the beginning. The name of the publication was changed to *Etudes de Lepidopterologie Comparée,* with Vol. 1, 1904, and the last installment received was part I of volume XXII, devoted to the genus *Agrias,* with eleven plates and thirty-three beautiful figures.

M. Oberthur took an intense interest in the variation of the Lepidoptera and published many figures showing these variations, a notable example being *Observations sur la variation des Heliconia vesta et thelxiope,* with ten plates and 120 colored figures.

In *Etudes de Lepidopterologie Comparée,* Fascicule XI, bis, appeared an interesting study of the grand Lepidoptera of Australia, genera *Coscinocera* and *Xyleutes,* by Oberthur, Houlbert and Dodd. This is notable for having what are among the best half-tone plates of insects that we have ever seen. Another feature is the illustration of the habitats of the insects treated, also groups of the native Australians. In many of the recent volumes of his studies he gives pictures of the country and of the places where rare or interesting species have been found.

The Lepidopterists of America should be profoundly grateful to M. Oberthur for his kindness in publishing splendid figures of the Boisduval types of butterflies. Students here were very uncertain as to the identity of a number of species and the generosity of our deceased friend has cleared up some difficult problems. The figures mentioned are in Vol. ix, 1913. He also published figures of American species of butterflies and moths described by other authors here and in Europe.

Several years ago, in the *Etudes,* he published a series of 40 portraits of distinguished Lepidopterists and evidently intended

to continue this interesting collection, had he lived. He has been honored by many Societies, including honorary fellowship of the Entomological Society of London in 1908.

He was a remarkable man of intense enthusiasm for the study of the Lepidoptera and an activity in the work of sixty years is not common. He was an ideal correspondent and always willing to go to any amount of trouble to supply information. He loved all aspects of the study and published some poems on insect life, the work of other authors, that he admired. Many of the papers published in the *Etudes* were by the pens of other persons, but the publisher was the magnet and the guiding star around which they revolved. He was most generous in giving credit to everyone, including the artists.

M. Oberthur was born at Rennes, France, on the 14th of September, 1845, being nearly 79 years old at the time of his decease.

"Priez Dieu Pour Lui."

HENRY SKINNER.

## New Muscoid Diptera.

By H. J. REINHARD, Amherst, Ohio.

**Frontina ferruginea** new species.

♂ Eyes bare. Front at vertex one-third width of head, wider before, cinereous pollinose on the sides, with numerous fine hairs outside of the frontals. Vitta reddish-brown, about one-third width of front, split posteriorly enclosing ocellar area. Ocellar bristles present, directed forward and outward. Frontals in two rows, the three uppermost bristles in each row strong and directed backward, the others weaker, directed inward and decussate to base of antennae, where rows diverge extending downward on sides of face to or slightly below level with arista. No orbital bristles. Posterior orbits, cheeks, facial depression and sides of face, silvery-white. Face receding, sides narrow, bare below lowest frontals. Facial depression large and rather deep, ridges ciliate upward almost to lowest frontals. Vibrissae strong, cruciate, inserted on level with oral margin. Cheeks hairy below, narrow, width about one-fourth the eye-height. Antennae almost as long as face, basal joints yellowish, very short, third joint blackish, elongate, front border practically straight. Arista brownish-black, bare, thickened to middle,

second joint twice as long as broad. Proboscis very short, fleshy, labella large, blackish. Palpi yellow, curved upward, somewhat thickened beyond basal third, bearing short black bristles with several longer hairs on lower surface.

Thorax gray pollinose, with four distinct black vittae, the outer pair interrupted at suture and reduced to triangular spots in front, inner pair narrower, entire, ceasing about midway between suture and base of scutellum. Four post-dorsocentral and four sternopleural bristles. Scutellum black, grayish pollinose, three pairs of marginal bristles, besides a shorter, cruciate, apical pair directed almost vertically.

Abdomen reddish-yellow, with a distinct median black vitta, hind margins of third and fourth segments sometimes blackish. Bases of last three segments white pollinose, elsewhere subshining. Bristles marginal only. Segments one and two, each, with a median pair; three, with a complete row; four, with a sub-marginal row.

Wings hyaline, without costal spine, veins yellow. Third vein with two or three short bristles at base, all others bare. Apical cell open, terminating far before tip of wing. Fourth vein arcuate beyond bend, without stump or wrinkle. Hind crossvein a little curved, slightly approximated to bend of fourth. Calypteres white.

Legs blackish, basal joints and base of femorae sometimes yellowish. Middle tibiae with one large bristle on front edge near middle, hind tibiae outwardly ciliate. Pulvilli and claws short.

Total length 5.5-6.5 mm.

♀. Differs by having two pairs of orbital bristles, second antennal joint longer, third joint shorter and yellowish. Bristles on facial ridges usually not extending as high, and less densely pilose on sides of front outside of frontals.

*Type:* Male, deposited in the United States National Museum, Washington, D. C. Described from six male and three female specimens, collected at College Station, July, September, 1920, July, 1923 (H. J. Reinhard).

In Coquillett's key this species runs to *rileyi* Will. (*irrequieta* Walk. of authors). It resembles that form rather closely in coloration, but may be readily distinguished by the smaller size, elongate third antennal joint, facial ridges less diverging below, a pair of median marginal bristles on first two abdominal segments, etc.

**Oxynops robusta** new species.

♀. Black, shining, faintly pruinose. Width of head at vibrissae much shorter than at base of antennae. Eyes large, apparently bare, but with sparse, short hairs. Front at vertex two-thirds the width of either eye, sides shining black above, whitish pollinose below. Vitta velvety, brownish-black, narrowing behind where it divides on each side of ocellar area. No ocellar bristles. Two proclinate and two reclinate fronto-orbital bristles, the latter pair situated in a straight line with the inner verticals, and about equidistant from each other. Outer verticals not developed. Uppermost frontals weak, stronger downward, decussate to base of antennae, and extending on sides of face to apex of second antennal joint. Face slightly wider than front, sides bare, silvery, almost linear below. Facial depression large and deep, whitish, ridges diverging, bristly almost to base of third antennal joint. Vibrissae decussate, inserted on level with oral margin and slightly above lower corner of eye. Antennae almost reaching oral margin, black, basal joints short, front side of third joint straight. Arista black, slender, slightly thickened near base, second joint hardly longer than broad. Cheeks very narrow. Proboscis black, short and fleshy. Palpi black, spatulate, almost reaching tip of proboscis.

Thorax thinly white pollinose, more pronounced anteriorly to suture and on pleurae. Four dorsal vittae apparent anteriorly, obsolete posteriorly to suture. Four post-dorsocentral and two sternopleural bristles. Scutellum black, shining, thickly covered above with short, black erect hairs, marginal bristles three pairs, in addition to a shorter sub-erect apical pair.

Abdomen short, shining black, clothed with recumbent bristly hairs, white pollinose on narrow bases of last three segments. Without discal bristles. Segments one and two, each, with a median pair; three, with a complete row; four, with only short bristly hairs.

Wings considerably longer than abdomen, hyaline, faintly tinged with yellow near base. Costal spine not well developed, all veins yellow, bare, except third which has one or two black bristles near base. Apical cell open, ending shortly before wing-tip. Bend of fourth vein broadly rounded, without stump or fold. Hind crossvein nearly straight, nearer to bend of fourth than to small crossvein. Calypteres distinctly tawny.

Legs black, without strong bristles. Middle tibiae with one bristle on front side beyond the middle, hind tibiae evenly ciliate. Pulvilli very short, claws somewhat longer.

Total length 6.5 mm.

*Type:* A unique female, collected at College Station, Texas, April 25, 1923 (H. J. Reinhard), deposited in the United States National Museum, Washington, D. C.

Aside from the great disparity in size this species agrees fairly well with the genotype, *nitens* Coq., with the following differences: abdomen pollinose on bases of last three segments, front proportionately wider, no ocellars, four dorsocentrals, etc. In relationship this genus is near *Hypostena* (of Coquillett) and is erected mainly on reproductive and early stage characters.

**Pilatea albicincta** new species.

♀. Black, densely grayish pollinose. Eyes rather small, bare. Front at vertex nearly the width of either eye, rather prominent before, sides cinereous, practically destitute of weak hairs. Vitta black, occupying one-third width of front, slightly narrower behind, cleft in front of ocelli and extending linearly on either side. Ocellar bristles strong, directed forward and outward. Inner and outer verticals developed, directed backward, the latter about one-half as long as inner pair. Frontal rows diverging at base of antennae, extending downward on sides of face to apex of second antennal joint, upper two bristles in each row before verticals directed backward, others directed inward and decussate to base of antennae. Two pairs of proclinate orbitals present. Face, facial depression, cheeks, and posterior orbits cinereous pollinose. The latter broad below, almost linear at vertex, bordered behind by a fringe of alternating long and short black hairs. Face broader than front, sides moderately wide, bare beneath lowest frontals. Facial ridges diverging, not prominent, with only four or five bristles at the base. Vibrissae strong, cruciate, inserted a little above the front border of oral margin. Cheeks sparsely hairy, width nearly one-half the eye-height. Antennae distinctly shorter than face, basal joints short, yellowish, third joint nearly three times length of second, black, covered with grayish pubescence. Arista brownish-black, practically bare, slender, slightly thickened near base, penultimate joint hardly longer than broad. Proboscis short, labella large and fleshy, yellowish. Palpi yellow, slender, bearing numerous short black bristles and a number of long fine hairs near the middle on the under side.

Thorax gray pollinose, mesonotum faintly brassy, with four distinct vittae. Post-dorsocentral bristles four, sternopleural bristles three, the lowest of which may be hairlike. Scutellum black, densely pollinose except near base, with three pairs of

marginal bristles, the posterior pair divergent, reaching to base of second abdominal segment.

Abdomen somewhat conical, black, first segment faintly pollinose, last three segments with broad whitish cross-bands, narrow hind borders of the intermediate segments sub-shining. First segment with a lateral marginal bristle, and a median marginal pair; second, with a median marginal and discal pair and a lateral marginal one; third, with a discal pair and a row of marginals; fourth with a row of marginals and discals. Median discals erect and asymmetrically placed.

Wings grayish hyaline, veins yellowish, costal spine small. Third vein with three short bristles near base, all others bare. Apical cell narrowly open, ending shortly before wing-tip. Angle at bend of fourth vein broadly obtuse, without fold or wrinkle, vein beyond bend almost straight in approaching the third, curving outward near the tip. Hind crossvein strongly bent inward near the base, distinctly approximated to bend of fourth vein. Calypteres white.

Legs black, basal joints densely pollinose. Middle tibiae with one strong bristle at middle on front side, hind tibiae not ciliate. Claws and pulvilli short.

Total length 7 mm.

*Type:* A single female, collected at College Station, Texas, April 8, 1921 (H. J. Reinhard), deposited in the United States National Museum, Washington, D. C.

This species differs from *celer* Coq., in having wider cheeks, front more prominent before, parafrontals cinereous. From *unicolor* Tns., it may be distinguished by the wider cheeks, hyaline wings, etc.

**Sturmia chrysoprocta** new species.

♂. Front prominent, at vertex almost as wide as either eye, sides silvery, clothed with fine black hairs outside of frontal rows. Vitta reddish-brown, distinct, enclosing ocellar area, before ocelli about equal to width of parafrontal. Eyes bare. Ocellar bristles present, proclinate. Outer vertical bristles weakly developed, inner pair and the uppermost frontal in each row strong, directed backward, other frontal bristles directed inward, decussate to base of antennae, where rows diverge extending downward on sides of face to level with arista. No orbitals present. Posterior orbits, cheeks, facial depression and sides of face, silvery on a yellow ground color. Face much wider than front, sides bare, about one-third the width of facial

depression. The latter rather flat, triangular in outline, ridges flattened near base, bearing several irregular rows of short bristles which extend upward to or slightly beyond apex of last antennal joint. Vibrissal angles somewhat approximated (vibrissae broken off near base, the remaining stumps indicate them strong and decussate as usual), inserted slightly above oral margin. Cheeks hairy, width about one-third the eye-height. Antennae two-thirds as long as face, entirely yellow, third joint one and one-half times as long as second. Arista yellowish, bare, short and thickened almost to tip, penultimate joint not longer than thick. Proboscis short, yellowish. Palpi yellow, slender, not thickened beyond base, bearing black bristles.

Thorax black, gray pollinose, with four dorsal vittae. Post-dorsocentral bristles four, sternopleurals four, surrounded by numerous long pilose hairs. Scutellum grayish pollinose, yellow on the apical half, with three pairs of marginal bristles, besides a shorter, sub-erect, cruciate, apical pair.

Abdomen conical, densely clothed with recumbent hairs, faintly pollinose, sub-shining. Last segment yellow, others blackish, venter rufous. Bristles marginal only. Second segment with a lateral pair and median pair; third, with a complete marginal row; fourth, with a sub-marginal row.

Wings normal, without costal spine, grayish hyaline, veins yellow. Apical cell open, ending far before wing-tip. Third vein with three bristles near the base, others bare. Bend of fourth vein rounded, without stump or fold, straight from bend to wing-tip. Hind crossvein slightly bent inward at the middle, much nearer bend of fourth than to small crossvein. Calypteres white.

Legs yellowish, bristly, middle tibiae with two or more bristles on front side near the middle, hind tibiae evenly ciliate. Front pulvilli nearly as long as last tarsal joint. Claws elongate, yellow, tips black.

Total length 9 mm.

*Type:* A unique male specimen, from Riley County, Kansas (Popenoe), deposited in the United States National Museum, Washington, D. C.

This species is congeneric in the strict sense, with *vanessae* Desv., the genotype. The short wholly yellow antennae will serve to separate it from most of our species in this genus.

# The Azalea Leaf Miner (Lepid.: Tineidae).[1]

By F. M. Trimble, Bureau of Plant Industry, Harrisburg, Pa.

(Plate VIII.)

## Economic Importance.

The greenhouse azaleas are popular flowering shrubs used extensively for ornamental purposes during the winter months throughout the United States. The young plants are grown in the field, and with the approach of fall are placed in cool greenhouses, from which they are taken to be forced into bloom as needed. During this period they are usually planted in separate pots and kept pruned to some definite shape. These azaleas are also grown in many other parts of the world, and previous to the passage of the Federal Horticultural Board quarantine number thirty-seven, large quantities of many varieties were shipped into the United States from foreign countries.

The azalea leaf miner infests a large percentage of the many varieties and causes a great deal of injury, particularly while being forced in the hot, well lighted greenhouses. In some greenhouses it ranks as the major pest of azaleas, especially in those houses not fumigated regularly.

## History.

The azalea leaf miner was first observed in Holland in 1912 by Prof. Ritzema Bos, who found it infesting large numbers of young plants of *Azalea indica* which had just previously been imported from Japan.

In the winter of 1911 Dr. E. P. Felt, of New York, collected several specimens of this pest on azaleas, and in 1914 Mr. A. Busck described it as *Gracillaria azaleae*. However, Mr. Edward Meyrick in England declared it to be identical with *G. zachrysa* Meyrick, an apple pest of India and Ceylon. Mr. Meyrick corrected this in 1918 by stating that *G. azaleae* Busck was a synonym of *G. azaleella* Brants and was probably a native of Japan, notwithstanding the fact that it is very closely allied to the North American group of *Gracillaria superbifrontella* Clem. and allies.

[1] *Gracillaria azaleella* Brants.

## Host Plants.

This Microlepidopteron has not been found, as yet, to have attacked other plants than the varieties of ornamental azaleas and then only seriously injuring those varieties forced in greenhouses such as *Azalea vervaveana, A. hinodegiri, A. grandiflora* and their varieties.

## Distribution and Spread.

Since 1911 this leaf miner has been taken in greenhouses throughout Pennsylvania and has been reported many times from other northeastern states and Canada, as well as during port inspection of imported nursery stock.

We may expect to find this pest in any greenhouse where azaleas have been imported in quantities, or where the parent plants are held over from year to year without being properly fumigated. While the azaleas are growing out-of-doors in the summer this small moth readily infests any clean stock nearby with almost the same rapidity as when retained in the greenhouse.

Injury is due to numberless larvae mining the leaves and skeletonizing the infolded tip portions. Such injured leaves turn yellow and soon drop. Under ideal forcing conditions, in a well lighted and heated greenhouse, injury is very rapid and within a few weeks many plants may be completely defoliated. The rate of defoliation depends chiefly on the variety of azalea infested. In comparison *A. hinodegiri* will lose its leaves much more quickly than the larger leaved varieties, such as *A. vervaveana.*

With the smaller-leaved varieties a single larva often webs several leaves together and the plant is soon defoliated by relatively few larvae. In no case were larvae observed to web all the leaves on a terminal into a single chamber, or to mine the terminal twigs. No record of bud injury was found, but it is the effect of defoliation on the buds that causes a loss to the florist. When a large plant is only partly defoliated, that portion without leaves forces its buds open one to two weeks before the uninjured portion (see Plate VIII, fig. 5). This ruins the plant for the trade. It is possible, however, to sell some varieties when heavily budded and yet defoliated, because

under full bloom condition the leaves are practically covered over by the flowers (see Plate VIII, fig. 4).

### Description of the Insect.

*Eggs*. Creamy white in color, oblong, .75 mm. by 1.25 mm. and placed singly on the underside of the leaf close to the mid-rib where they are partially hidden in the pubescence.

*Larvae*. Full grown larvae are about 19 mm. in length, head usually large, depressed, yellowish, mouth parts well developed and the eyes apparently represented by a large, circular, brown spot. Thoracic legs well developed, thorax yellowish and with the region just above each leg marked by several distinct swellings. Abdomen apodal, yellowish, and with a distinct though irregular fuscous band on the penultimate segment. The newly born larvae are about .75 mm. long and spend approximately one-quarter of the caterpillar stage in a gallery mined between the upper and lower epidermis of the leaf see Plate VIII, fig. 1). Later the larvae emerge and turn over the tips of the leaves, webbing each down with fine silken strands (see Plate VIII, fig. 2).

*Pupa*. Within a cocoon about 6 mm. long and 2 mm. in diameter, faintly suggesting the *Bucculatrix* cocoon, without distinct longitudinal ribs. The cocoon is a well defined silken structure usually lying longitudinally on the underside of the leaf, protected partially by the curled over tip or lateral margin of the leaf (see Plate VIII, fig. 3). Occasionally they may be found on small twigs wherever a little protection is afforded.

*Adult*. A small, delicate, close-winged moth with an alar expanse of 11-12 mm. The antennae are as long as the fore-wings and brownish-white. The labial palpi, with the second joint light golden yellow and terminal joint yellowish white with the front of the tip blackish brown, are conspicuous in front of the silvery white face. The head and thorax are light golden yellow mixed with dark purple. The fore-wings are yellowish with large purplish areas and a large yellow costal area beginning at the basal fourth and extending to near the apex, is widest at its basal fourth, but diminishes in width at the middle of the wing and covers less than one-third of the width of the wing. The purplish areas are more or less sprinkled with yellow scales on some specimens and on the costal edge is a series of minute purplish black dots. The hind wings are light pearly gray in color, frail, slender and heavily fringed with long hairs. The abdomen is dark silvery fuscous above and yellowish white beneath. The femora are dark purple in color; tarsi white with narrow black annulations at the joints; tibia of middle legs somewhat thickened with scales.

The adult is only capable of short flights made in a jerky motion and when in a resting position the moth has the forepart of the body raised by the full length of the fore legs with the tip of the abdomen touching the leaf on which the moth is resting. In this position the third pair of legs are held close to the sides of the folded wings and support the weight of the body. The broods overlap extensively and vary in length from three weeks to two and a half months according to the temperature of the surrounding conditions.

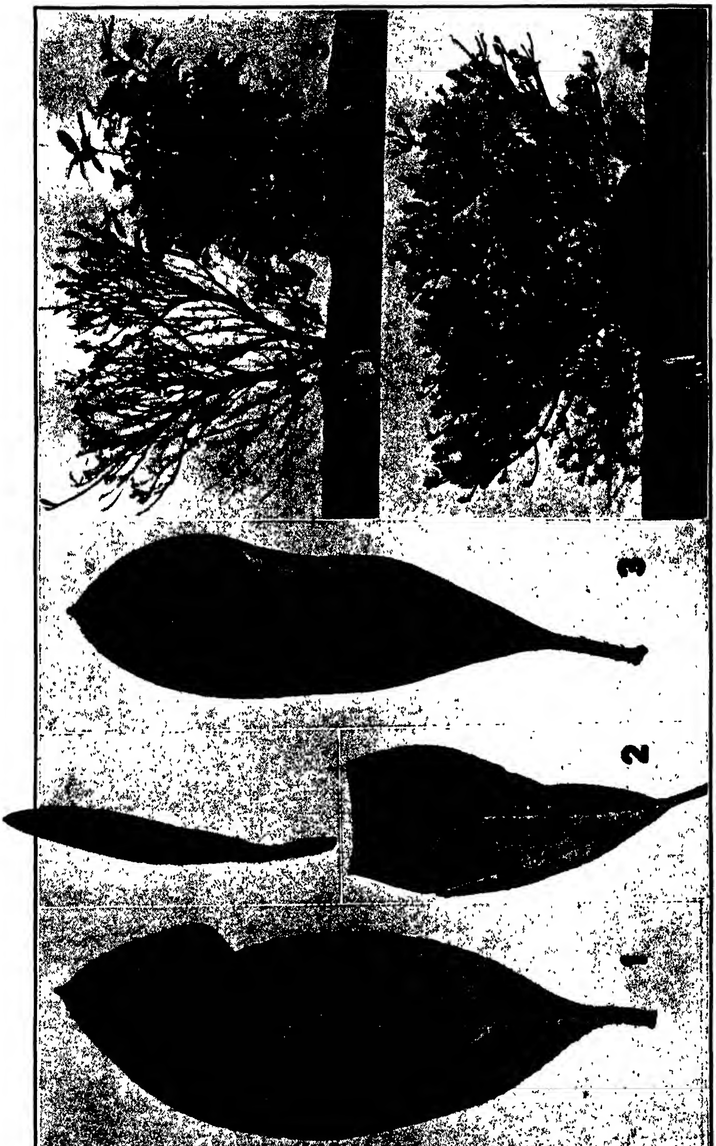
### Natural Enemies.

When the azaleas are out-of-doors in the summer the ravages of the leaf miner are checked and it is believed that the varying weather conditions are the chief factors in the destruction of many of the tender larvae and frail adults. However, the writer has observed the larvae of a *Chrysopa* sp. at work killing leaf miner larvae where some agency had previously torn the silk which held over the folded leaf tip. During many rearing experiments only one parasite was found to kill the leaf miner in the greenhouse and Mr. A. B. Gahan, of the U. S. Bureau of Entomology, identified this Chalcid parasite as belonging to the genus *Sympiesis,* closely allied to *S. massasoit* Crawford.

### Recommendations for Control.

Stomach poisons and contact insecticides used commonly in controlling greenhouse insects were given thorough trials under varying conditions and none of them gave satisfactory results. In not one count were more than 40% of the larvae killed. This is probably due to the fact that the eggs are well protected among the leaf hairs on the underside of the leaf, the small larvae are in galleries between the upper and lower epidermis of the leaf, and the older larvae are within well made folds of the leaf protected by a wall of silk. Even several hours' immersion in water would not kill the older larvae within their confines.

It was found that thorough fumigation of all plants with hydrocyanic acid gas while being kept in the cool greenhouse, previous to forcing, will kill 90 to 95% of the miners. Then by the use of regular nicotine sulphate fumigations in the forcing greenhouse, on alternate nights, the newly hatched larvae




AZALEA LEAF-MINER AND ITS WORK.—TRIMBLE.

can be quickly killed. In a private greenhouse the removal of all infested leaves by hand would quickly control the pest.

## Conclusion.

The loss of leaves on azaleas in the greenhouse and consequent unfitness of the blooming plant for the trade is often due to the azalea leaf miner *(Gracillaria azaleella* Brant).

In the course of thorough investigation it was found that this leaf miner is a native of Japan and was imported into North America on azaleas from Belgium and Holland, where in turn it had been received from Japan on young plants. Fortunately, so far it has remained on its native host plants.

The characteristic injury caused by this insect appears soon after the plants are placed in the greenhouse for forcing. The leaves drop on being mined and skeletonized by the larvae, leaving the azalea a leafless shrub unfit for the trade.

Cyanide fumigation followed later by alternate night fumigations with nicotine sulphate will control the pest.

## Bibliography

Brants, 1913, Tijdsch. voor Entomologie, Vol. 56, p. 72.
Brock en Schenk, Zieckten in Beschadigingen der Tuinbouwgewassen.
Busck, 1914, Insec. Inscit. Mens., Vol. 2, No. 1, p. 1.
Busck, 1915, Insec. Inscit. Mens., Vol. 3, Nos. 1-4, p. 42.
Felt, 1913, 29th Rep. St. Ent. of N. Y., p. 21.
Felt, 1915, 31st Rep. St. Ent. of N. Y., p. 91.
Gibson & Ross, 1922, Bull. 7 n. s., Can. Dept. Agr., p. 26.
Howard, 1918, Jour. Ec. Ent., Vol. 11, No. 6, p. 482.
Meyrick, 1915, Exot. Micro., Vol. 2, p. 179.
Sasscer, 1918, Jour. Ec. Ent., Vol. 11, No. 1, p. 127.
Weiss, 1916, Jour. Ec. Ent., Vol. 9, No. 1, p. 212.
Weiss, 1918, Entomological News, Vol. 29, p. 114.
Weiss, 1918, Jour. Ec. Ent. Vol. 11, No. 1, p. 123.

## Explanation of Plate VIII.

Fig. 1. Ventral side of azalea leaf showing primary gallery.
Fig. 2. Azalea leaves with tip and lateral margins folded.
Fig. 3. Usual location of cocoon on ventral side of leaf.
Fig. 4. Completely defoliated azalea with buds advanced in season. Plants still salable.
Fig. 5. Unsalable defoliated *Azalea vervaeana* compared with uninjured plant.

(Photographs: 1, 2 and 3 by H. B. Kirk; others by the author.)

## Milesia in North America (Dipt.: Syrphidae).

By Frank M. Hull, Ohio State University, Columbus, Ohio.

Several specimens of a *Milesia,* nearly allied to *virginiensis* Drury, but obviously quite distinct, have been in the writer's collection several years, and have attracted his attention to the genus. The species is close to *virginiensis,* but is distinguished by at least three characters that are constant. The scutellum is almost wholly yellow, and with only a very narrow black line basally. Secondly, they differ in the yellow maculation of the thorax, as described below. Lastly, the black transverse markings of the abdomen, and especially those of the second segment, are considerably narrower than in *virginiensis.* The wings are usually more heavily tinged with brown. The species seems to be slightly more southern in distribution.

It was at first thought that the form might be one of the older names listed in the synonomy of its more common ally. A careful examination of these older descriptions, including such as *M. limbipennis* Macq., *M. ornata* Fabr., *M.* (*Sphyxea*) *fulvifrons* Big., etc., fails to reveal any evidence that such is the case. It is rather difficult to obtain any satisfaction from such brief descriptions, but the scutellum of the species is quite distinct, and in the older descriptions, the scutellum where mentioned, is described as in *M. virginiensis.* A brief description of the form, together with a key to the four better known North American species, and notes on others are given below.

*Key to Species of North American Milesia*

1. Scutellum widely black basally...................... 2
   Scutellum almost wholly yellow.......... *scutellata* n. sp.
2. Humeral spots not connected with the two median yellow stripes of thorax, or very narrowly so.............. 3
   Humeral spots connected by a band with the two median yellow stripes of the thorax; the latter not continuous with the transverse "sutural" band....... *virginiensis* Drury
3. Median pair of yellow thoracic stripes continuous posteriorly, past the middle or "sutural" transverse band of thorax ..............................*pulchra* Will.
   Median pair of yellow thoracic lines not continuous posteriorly, past the middle or transverse band......*bella* Town.

**Milesia scutellata** n. sp.

♂.—Antennae, face and front, golden yellow. Cheeks yellow,

with a black spot basally, on the orbits. Upper half of front and vertex black; lower half of front and occiput, yellow.

Thorax black, marked with yellow, similarly to *virginiensis*, but differing as follows: in that species there are two transverse, medianly interrupted, yellow bands on the thorax, the first between the humeri, the second just behind the suture. The median, broken ends of the humeral band are turned down and drawn out acutely to a point, but never continuous with the sutural or second band of the thorax; in *scutellata* the two bands are broadly connected in the middle, forming thus two U's, their open ends facing outward, laterally. Scutellum almost wholly yellow, with a narrow basal band of black. In *virginiensis*, some two-thirds of the scutellum, basally, are black.

Black markings of the abdomen similar to that species, but narrower. Legs nearly the same. Wings usually more heavily brownish. A trifle smaller than the average *virginiensis*.

♀.—Similar to the male. Front with a black median stripe.

*Type* male and five male paratypes, from Mississippi Agricultural and Mechanical College, in the author's collection. Two males and one female, from Florida and North Carolina, in the collection of Dr. R. C. Osburn. One female (allotype), from Louisiana, in the Ohio State University collection.

I have examined over two hundred and fifty specimens of the common form, and among them I find the above ten specimens, all of them quite constant. Williston mentions having a specimen from Carolina, similar to what I have described above. He describes the scutellum and abdomen, although he does not mention the bands of the thorax being connected.

The characters here used by the author have been carefully considered and inasmuch as they form two of the principal characters, by which the European species *crabroniformis* Fabr., and type of the genus, is distinguished, they are considered good. In that species the black of the abdomen is largely replaced by obscure reddish, the front of the female is wholly yellow, etc. *M. bella* Town., of this country, likewise has the bands of the thorax connected, as described.

*M. pulchra* Will. is really as close to *virginiensis*, as is *scutellata*.

**Milesia profusa** Walk.

This species has not been recognized since it was described. The generic reference of the species is even a little doubtful, as

many of the older authors were in the habit of making *Milesia* a "dumping ground" for species. It was described as only eleven millimeters in length (I have seen *M. virginiensis* that were scarcely longer than this) and the abdomen black with two yellow spots on each side. It is not included in the key.

**Milesia bella** Townsend.

*M. bella* Town., Annals and Mag. Nat. Hist., xix, p. 142.

*M. mida* Moody, Ent. News, xvi, p. 138.

Specimens of this species studied, are from Arizona, in the Ohio State University collection. *M. mida* Moody is, according to Professor J. S. Hine, and Moody himself, a synonym of *M. bella.*

**Milesia virginiensis** Drury.

This species varies considerably in the breadth of the abdomen, nor is the greater breadth to be found in females only. The average size of the fly is about 20 mm.; they frequently attain a length of 24 mm., and I have three specimens of about 14 mm., length, and correspondingly slender. My material is from New Jersey, Pennsylvania, Ohio, Mississippi, Louisiana, Tennessee, and South Carolina. Also recorded from Nebraska, Wisconsin, Virginia, Florida, Georgia, New England and North Carolina.

**Milesia pulchra** Will.

Information concerning the species has been drawn from the excellent description and figure to be found in the Biol. Centr. Americana.

## Stilobezzia mallochi and Atrichopogon gilva (Dipt.: Chironomidae.)

By W. A. Hoffman, Dept. of Medical Zoology, School of Hygiene & Public Health, Johns Hopkins Univ., Baltimore, Md.

A recent examination of the Ceratopogoninae contained in the National Museum collection brought to light an unnamed specimen that roused my interest. It was readily shown to be conspecific with what Malloch termed *Hartomyia gilva* Coq. This species has been referred to by him first[1] as *Johannseniella,*

[1] Bull. Ill. State Lab. Nat. Hist., vol. X, Article IV, 1914, p. 227.

then as *Hartomyia gilva*[2]; for which the following localities have been given: Ithaca, New York; Swarthmore, Pennsylvania, and Polk County, Wisconsin. At the time he was gathering data relating to the Chironomidae of Illinois, he had no access to the types of Coquillett, which comprise no inconsiderable portion of the described members of this group, insofar as North America is concerned. Therefore, the above-mentioned material was determined as *Hartomyia* (*Ceratopogon*) *gilva*, since the specimens before him corresponded closely to the original description.

A study of Coquillet's type of *Ceratopogon gilvà* disclosed the fact that this form must be placed in Kieffer's genus *Atrichopogon*. *Hartomyia* Mall., on the other hand, is synonymous with *Stilobezzia* Kieff. The specimens considered by Malloch represent a new species. Owing to the unavoidable confusion that has arisen, the preferable procedure seems to be naming and describing this form. Mr. Cresson, of the Philadelphia Academy, and Dr. Johannsen, of Cornell University, kindly placed at my disposal two representatives, the one taken at Swarthmore, Pa., having been studied and identified by Malloch. The specimen in the collection of the National Museum, and that in Dr. Aldrich's personal collection, are at present not available.

**Stilobezzia mallochi,** new species.

♀ : Occiput, frons, clypeus, first segment, torus, and basal half of the third segment of antenna yellow. Eyes approximating each other at a point just above vertex. Palpi fumose, the two terminal segments more noticeably so; fourth segment little more than six-tenths the length of terminal one. Proboscis from above a grayish yellow, except the maxillae which are brown. The proboscis equal to the distance from its base to the vertex. Flagellum grayish brown, last five segments approximately equal in length to remainder of antenna. Six segments succeeding torus about equal in size, that is, slightly less than two and one-half times as long as wide; the length of the terminal member more than five times its width. From seventh segment on, more hairs are to be found on the individual segments, especially on the last five, those comprising the basal whorls of each segment, longer.

Greater portion of the mesonotum, shiny, rufous brown, a considerable, more or less square, humeral area creamy yellow.

---

[2] Ibid., Article VI, 1915, pp. 340 and 343.

Along the medial line runs a row of well separated long black setae. Midway between it and the borders is a pair of similar rows, diverging slightly from the anterior region, being continued along the sides of the prescutellar depression. The courses of the latter are indicated by fine faintly yellow stripes. There is also a pair situated more laterally without the yellow background of preceding, which terminate before the wing bases. Scutellum bright shiny yellow, with a row of nine long black setae following somewhat the contour of the posterior border. Metanotum rufous, glabrous. Apical half of knob of halteres cream color, remainder yellow. Legs long without distinct spines, a uniform yellow, except coxae and knees, which are darker. Hind metatarsus twice the length of second segment. Fourth segment deeply bilobed (as is the case with the two anterior pairs), much shorter than the succeeding segment. The claws are dark brown, unequal in size, the outer member being sickle-shaped, more than twice as long as the inner one, and about equal in length to the fifth segment.

Wing without macrochaetae except a few in apical fifth. Vein R1, its branches, and vein M as far as the crossvein, thick, pale yellowish brown. Vein R4 + 5 (third longitudinal) meeting costal margin a little beyond four-fifths of wing length. Second radial cell two and one-half times length of first. A small basal portion of vein $M_2$ has virtually disappeared. The forking of Cu is a trifle basad of the lower end of the radio-medial crossvein. The first anal vein nearly attains the lower margin.

Dorsum of abdomen a dirty though not dark grayish brown, scantily set with weak black hairs, those at side a little stronger. Lower and lateral surfaces more or less of an orange shade.

Length of body, 2.5 mm.; of wing, 2 mm.; width of wing, .65 mm.

♂: In general similar to female. Occiput dark brown. Antennal plumes golden yellow. The setae on the thorax and hairs on the abdomen are on the whole coarser. The hairs on the legs are likewise heavier. Claws subequal, those of hind tarsi three-fifths the length of terminal segment. Vein R4 + 5 attaining costal margin a little before four-fifths of wing length. Second radial cell two and one-fourth times length of first.

Length 2.2 mm.; of wing, 1.88 mm.; width of wing, .58 mm.

Female *type* from Ithaca, New York, July; in Cornell University collection. Male type from Swarthmore, Pa., June 10, 1906 (Cresson); in collection of Academy of Natural Sciences, Philadelphia. The species is dedicated to Mr. J. R. Malloch, of the Bureau of Biological Survey, who has contributed materially to our knowledge of North American Ceratopogoninae.

# Odonata from Kentucky.

By H. Garman, Lexington, Ky.

This list is based upon collections accumulated incidentally while studying and collecting other insects in the past 30 years during which time the writer has been connected with the Kentucky University and Experiment Station. Kentucky is too hilly and its streams in great part too rapid to afford the best collecting ground for Odonata, but there are regions within the State, notably the bottomland along the Ohio, Mississippi, and other rivers where dragon flies are very numerous and where special effort in collecting would doubtless reveal the presence of many other species. As presented the list is merely a nucleus about which a more complete representation of our fauna may be gathered. Since the State has had but little attention from collectors the records may be of present interest to those giving attention to the distribution of American species. The determined nymphs seem to the writer of special interest because adult dragon flies are likely to be carried by storms long distances from their normal breeding grounds and hence the appearance of an individual or two in a locality may not be very satisfactory evidence as to the habitat of a species.

The arrangement and names used are those of Muttkowski's "Catalogue of the Odonata of North America." Most of the nymphs and part of the adults have been determined by Dr. Philip Garman of the Connecticut Experiment Station.

Additional records, not species, are to be found in Mr. E. B. Williamson's paper in the News for January and February, 1923 (xxxiv, 7-8, 39-40), and in Prof. C. B. Wilson's (Proc. U. S. Nat. Mus. 43, 189-200, 1912), from both of which some quotations have been made below.

## Zygoptera.

Agrion angustipenne (Selys).—Kentucky (Hagen, Synopsis of the Odonata of America); (Hagen, Psyche, V, p. 242, Bee Spring, Ky., Mus. Comp. Zool.).

A. dimidiatum (Burm.).—Kentucky (Hagen, Syn. Neur. N. A.; Ky., Hagen, Psyche, V, 245, "Burmeister's Type").

A. maculatum Beauv.—Lexington, July 4, 1890; June

14-16, 1892; June 29, 1912; Clear Creek, Pineville, June 16, 1892; Aug. 31, 1911 (nymph).

HETAERINA AMERICANA (Fabr.).—Clay's Ferry, Fayette Co., July 17, 1893.

LESTES DISJUNCTUS Selys.—Lexington.

L. EURINUS Say.—Monticello, Aug. 6, 1918 (Williamson).

L. RECTANGULARIS Say.—Lexington; Indian Cr. Landing, 1911 (Wilson).

ARGIA APICALIS (Say).—Lexington, June 22, 1892; Tyrone, July 14, 1892.

A. FUMIPENNIS (Burm.).—Kentucky (Hagen).

A. MOESTA subsp. PUTRIDA (Hagen).—Straight Cr., Pineville, Oct. 21, 1911 (nymph).

A. SEDULA (Hagen).—Kentucky (C. B. Wilson).

A. TIBIALIS (Rambur).—Obion Cr., Hickman Co., Nov. 2, 1911 (nymph).

A. TRANSLATA (Hagen).—Kentucky (Wilson).

A. VIOLACEA (Hagen).—Lexington, June, 1892; High Bridge, Ky., Aug. 13, 1889.

ENALLAGMA ASPERSUM (Hagen).—Lexington, Aug., 1915 (Philip Garman); Monticello, Aug. 6, 1918 (Williamson).

E. CIVILE (Hagen).—Lexington, Aug. 22, 1889; Oct. 4, 1910; Sept. 17, 1915.

E. EXSULANS (Hagen).—Benson, July 31, 1915.

E. GEMINATUM, Kellicott.

E. SIGNATUM (Hagen).—Lexington, Sept. 26, 1896 (nymph).

NEHALENNIA IRENE (Hagen).—Lexington, June 29, 1916.

ISCHNURA POSITA (Hagen).—Lexington, Aug. 9, 1915; Sept. 3, 1915.

I. VERTICALIS (Say).—High Bridge, Ky., Aug. 13, 1889; Lexington, May 9, 1912 (nymph); Sept. 1 and 15, 1915.

ANOMALAGRION HASTATUM (Say).—Lexington, May 17, 1902; Aug. 28 and Sept. 17, 1915.

## ANISOPTERA.

TACHOPTERYX THOREYI (Hagen).—Nat. Bridge, Ky., Aug. 8, 1897; Cumberland Falls, July 5-8, 1911 (C. B. Wilson).

CORDULEGASTER OBLIQUUS (Say).—Kentucky (Hagen).

PROGOMPHUS OBSCURUS (Rambur).—Straight Cr., Pineville, Aug. 29, 1911 (nymph); Parkers Lake, July 9, 1911 (Wilson).

HAGENIUS BREVISTYLUS Selys. — Kentucky (Williamson, Dragonflies of Indiana).

LANTHUS ALBISTYLUS (Hagen).—Ky. (Howe, Proc. Bost. Soc. Nat. Hist., 36, 123, 1921).

L. PARVULUS (Selys).—Ky. (Howe, Proc. Bost. Soc. Nat. Hist., 36, 123, 1921).

GOMPHUS AMNICOLA Walsh.—Dayton, Ky., Chas. Dury (Specimen in New York Museum).

G. CRASSUS Hagen.—Kentucky (Williamson, Dragon flies of Indiana).

G. LINEATIFRONS Calvert.—Kentucky (Williamson).

G. EXTERNUS Hagen.—Kentucky (Hagen).

G. NOTATUS Rambur.—Cumberland Falls, July 5, 1911 (C. B. Wilson).

G. PALLIDUS Rambur.—Cloyd's Landing, Monroe Co., July 23, 1911 (C. B. Wilson).

G. PLAGIATUS Selys.—Burnside (Wilson).

G. SPINICEPS (Walsh).—Greasy Cr., Russell Co., July 17, 1917 (Wilson).

G. VASTUS Walsh.—Indian Cr. Landing, Russell Co., July 18, 1911 (C. B. Wilson).

DROMOGOMPHUS SPINOSUS Selys.—Kentucky (Hagen); Cumberland Falls, Parkers Lake, Burnside, 1911 (Wilson).

BOYERIA GRAFIANA Williamson.—Ky. (Muttkowski).

BOYERIA VINOSA (Say).—Left F. Straight Cr., Cary, Sept. 1, 1911 (nymph); Cumberland R., Pineville, Apr. 26, 1912 (nymph).

BASIAESCHNA JANATA (Say).—Straight Cr., Pineville, March, 1902 (nymph); Aug. 29, 1911 (nymph).

ANAX JUNIUS (Drury).—Sinkhole pond, Lexington, Dec. 16, 1889, and May 7, 1890 (nymphs); Nicholasville, July 19, 1890; Sept., 1922; Pond, Lexington, June 20, 1894 (nymph); Aug. 5, 1905; June, 1918; S. Elkhorn Cr., June 28, 1895 (nymph); Richmond, Sept. 19, 1906; Salt Lick, Sept. 21, 1915.

AESHNA UMBROSA Walker.—Jeffersontown, Aug. 5, 1918.

EPIAESCHNA HEROS (Fabricius).—Lexington, June 2, 1900; May 27, 1908; May 19, 1915; June 28, 1916; April 23, 1920; May 26, 1921; Jackson, Aug. 25, 1913.

DIDYMOPS TRANSVERSA (Say).—Nat. Bridge, Ky., May 9, 1914 (nymph from which adult emerged).

MACROMIA ALLEGHANIENSIS Williamson.—Ky. (Williamson).

M. ILLINOIENSIS Walsh.—Clear Cr., Pineville, June 16, 1892; Green R. between Greensburg and Mammoth Cave, July, 1894 (nymphs); Straight Cr., Pineville, Aug. 29, 1911 (nymphs); Ky. (Williamson).

M. TAENIOLATA Rambur.—Kentucky.

EPICORDULIA PRINCEPS (Hagen).—Burksville, July 30, 1911 (Wilson).

Neurocordulia obsoleta (Say).—Cumberland R., Pineville, Aug. 31, 1911 (nymph).

Somatochlora tenebrosa (Say).—Parkers Lake, July 9, 1911 (Wilson).

Libellula cyanea Fabr.—Along Clear Cr., Pineville, June 16, 1892.

L. luctuosa Burm.—Lexington, Aug. 17, 1893; Brooklyn Bridge, Ky., Aug. 6, 1916.

L. pulchella Drury.—Nicholasville, July 19, 1890; Lexington, Sept. 25, 1892; March, 1902 (nymph); Hickman, July 10, Aug. 26 and Aug. 27, 1913.

Plathemis lydia (Drury).—Sinkhole pond, Lexington, Oct. 26, 1889, and April 7, 1890 (nymphs); Lexington, May 1, 1890; pond, July 1, 1891; Oct. 30, 1891 (nymph); pond, April 30, 1892 (nymph); Aug. 8, 1893; May 20, 1895; small streams, Aug. 5, 1897 (nymph); Hickman, July 10, Aug. 10 and 20, 1913.

Perithemis domitia (Drury).—Lexington, June 28 and July 1, 1892; July 17 and Aug. 3, 1894; Sept. 1, 1915; Hickman, Aug. 18, 1913.

P. tenera (Say).—Madisonville, July 24, 1918 (Williamson).

Erythrodiplax minuscula (Rambur).—Ky. (Hagen); Ky. (Williamson).

Erythemis simplicicollis (Say).—Nicholasville, July 19, 1890; Lexington, Aug. 17-Sept. 19, 1893; Aug. 19 and Sept. 19, 1915; Hickman, Aug. 26, 1913.

Sympetrum rubicundulum (Say).—Lexington, Sept. 20, 1892; Aug. 31, 1894; Aug. 20, 1904; Oct. 29, 1912; July 17, 1923; Bryan Station, Sept. 4, 1894.

Pachydiplax longipennis (Burm).—Nat. Bridge, Ky., July 21, 1912; Hickman, Aug. 26, 1913; Lexington, Aug. 19, 1915.

Leucorhinia intacta Hagen.—Fishing Cr., Creasy Cr., Indian Cr., Cloyd's Landing, 1911 (Wilson).

Celithemis eponina (Drury).—Lexington, Aug. 17, 1893; Hickman, Aug. 18, 1913.

Pantala flavescens (Fabr.).—Hickman, Aug. 26, 1913.

P. hymenaea (Say).—Cumberland Falls, July 7, 1911 (Wilson).

Tramea lacerata Hagen.—Lexington, Sept. 1, 1890; Madisonville, July 24, 1918 (Williamson).

T. onusta Hagen.—Lexington, May, 1905; Fishing Cr., July 15, 1911 (Wilson); Monticello, Aug. 6, 1918 (Williamson.)

# Undescribed Species of the Genus Tanypremna Osten Sacken (Dipt. : Tipulidae).

By CHARLES P. ALEXANDER, Amherst, Massachusetts.

The genus *Tanypremna* is a very characteristic one in the humid tropics of the New World. The genus has been compact and well-delimited, but the accession of two new species has rendered it necessary to divide the genus into three subgenera, two of which are described at this time.

Genus **Tanypremna** Osten Sacken.

1886. *Tanypremna* Osten Sacken; Biol. Cent.-Americana, Dipt., vol. 1:19.

1914. *Tanypremna* Alexander; Journ. N. Y. Ent. Soc., 22: 206-215.

Subgenus **Ceoneura** subgen. n.

Characters as in *Tanypremna*, s. s.; vein $M_1$ deflected cephalad and fused with vein $R_{4+5}$ for almost its entire length, the free portion of $M_1$ represented only by a short, apparent cross-vein that closes a rectangular cell $R_5$ that is about one-half longer than cell *1st* $M_2$.

Type of the subgenus.—*Tanypremna (Ceoneura) idioneura* sp. n. (Neotropical Region).

**Tanypremna (Ceoneura) idioneura** sp. n.

General coloration brown, variegated with darker; scutellum broadly whitish medially; pleura yellowish white, narrowly and obliquely lined with dark brown; legs dark brown, tibiæ with a broad, white, sub-terminal ring; tarsi white except the basal three-fifths to four-fifths of metatarsi; wings subhyaline, the costal-region and wing-margin tinged with brown; veins $M_1$ and $R_{4+5}$ fused, enclosing a rectangular cell $R_5$ above cell *1st* $M_2$.

♀. Length 18.4 mm.; wing 10.8 mm.; abdomen alone 15 mm. Described from an alcoholic specimen.

Frontal prolongation of head very short, white; nasus very stout; palpi brown, the second and third segments largely white. Antennae short, the scapal segments pale, the flagellum brown. Vertex pale anteriorly, passing into dark brown behind.

Mesonotal praescutum brown medially, pale yellowish laterally; an indistinct median brown stripe that is crossed transversely by a pale band before mid-length of the sclerite; a capillary brown line extending to the anterior margin of the sclerite; a brown area at the humeral region; scutellum and median area of postnotal mediotergite broadly whitish, margined externally by dark brown, the lateral margins of the sclerite paler brown; postnotal mediotergite dark brown, the lateral

margins pale. Pleura yellowish white with a very narrow brown line running obliquely from the humeral region of the praescutum between the anepisternum and pteropleurite to above the mid-coxae; sternopleurite tinged with brown. Halteres brown, the base of the stem pale.

Legs with the coxae pale, the anterior face of the mid-coxa suffused with brown; trochanters yellow; tibiae dark brown with a conspicuous white ring (1.8 mm.) before the narrower (1 mm.) brown tip; basi-tarsi dark brown, the apical two-fifths (fore legs) to one-fifth (hind legs) pure white; remainder of tarsi pure white, only the terminal segment suffused with brown on its outer half; claws simple.

Wings subhyaline, the apical margin very faintly infuscated; cell *C* hyaline basally, passing into brown distally; cell *Sc* and the small stigma dark brown; veins dark brown. Venation: *Sc* long, $Sc_2$ extending to beyond mid-length of $R_{2+3}$; cell *2nd* $R_1$ very small; *Rs* short, straight, shorter than $R_{2+3}$; tip of $R_2$ persistent; $M_1$ fused with $R_{4+5}$ at about two-fifths the length of the latter, enclosing a rectangular or elongate cell $R_5$ above cell *1st* $M_2$; cell *1st* $M_2$ pentagonal, narrowed distally; fusion of $Cu_1$ and $M_3$ short.

Abdominal tergites dark brown, indistinctly variegated with paler; sternites obscure yellow; ovipositor ferruginous.

*Habitat.*—British Guiana. *Holotype:* ♀, Kartabo, August 4, 1919 *(A. E. Emerson)*. Type in the collection of Cornell University.

*Tanypremna idioneura* differs very notably from all the described species in its venation and leg-pattern. In the writer's key to the species of *Tanypremna* (Journ. N. Y. Ent. Soc., *22*: 207-208; 1914), the present species would run to the group containing *T. longipes* (Fabricius), *T. longissima* (Enderlein) and *T. manicata* Osten Sacken, differing from all in its diagnostic characters.

## Subgenus **Tanypremnodes** subgen. n.

Characters as in *Tanypremna,* s.s., differing chiefly in the structure of the antennae. In the female, the basal four flagellar segments are weakly and irregularly pectinate, on the second the base produced into a slender branch that is nearly as long as the segment; the branch of the third segment is reduced to a small basal serration; fourth segment with a conspicuous basal enlargement only; terminal flagellar segments elongate, with long, conspicuous verticils that become longer distally. Tibial spurs apparently lacking in the unique type. Wings with the distal section of vein $R_2$ entirely atrophied.

Type of the subgenus.—*Tanypremna (Tanypremnodes) leucoplaca* sp. n. (Neotropical Region).

**Tanypremna (Tanypremnodes) leucoplaca** sp. n.

General coloration pale brown; head dark orange; femora obscure yellow, the tips conspicuously blackened; tibiae black, the tips broadly white; tarsi black; wings strongly tinged with brownish yellow, the costal region darker brown; veins $Sc_1$ and $R_1$ close together at wing-margin.

♀. Length 22 mm.; wing 13 mm.; abdomen alone 18.5 mm.

Rostrum very short, yellow, the elongate palpi pale brown. Antennæ with the scapal segments brownish yellow; flagellum brown. Head dark orange, more saturated behind, somewhat paler in the vicinity of the tubercle.

Mesonotal praescutum pale brown with three yellowish brown stripes that are virtually confluent; remainder of mesonotum yellowish brown, the scutellum darker. Pleura obscure brownish yellow. Halteres dark brown.

Legs with the coxae brownish yellow; trochanters obscure yellow, femora obscure yellow, the tips conspicuously blackened; tibiae black, the extreme base obscure brownish yellow, the tips broadly white, occupying a little less than the apical third of the segment; tarsi black.

Wings with a strong brownish-yellow tinge, the costal region darker brown; stigma very small and vaguely delimited, brown; center of cells *R* and *M* with longitudinal pale centers; veins black, those in the base and costal region brown. Venation: $Sc_1$ ending close to $R_1$ at wing-margin; *Rs* relatively short, about two-thirds $R_{2+3}$, oblique; distal section of $R_2$ entirely atrophied; cell $M_1$ large, its petiole shorter than *m;* cell *1st* $M_2$ large, pentagonal; basal deflection of $Cu_1$ longer than $Cu_2$ alone; cell *2nd A* of moderate width.

Abdomen dark brown, the caudal margins of the segments somewhat paler; sternites variegated with brown and obscure yellow.

*Habitat.*—Brazil. *Holotype:* ♀; Upper Rocana, Northern Para, June, 1918 *(S. M. Klages).* Type in the collection of the Carnegie Museum, Accession No. 6175.

This interesting crane-fly was included in extensive series of Tipulidae sent to me for determination by Mr. Kahl, to whom I am greatly indebted for numerous favors. The present species is readily told from all other known species of the genus *Tanypremna* by the broad white tibial tips and the absence of white on the tarsi.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., OCTOBER, 1924.

## The Monument to J. Henri Fabre.

The monument, for which subscriptions were asked in the NEWS for April last (page 144) was inaugurated at Sérignan, on July 27, 1924, under the presidency of M. Mangin, director of the National Museum of Natural History of Paris, according to a communication from M. H. de la Paillonne, Mayor of Sérignan. A picture postcard of the monument, issued for the occasion, represents Fabre seated on the stump of a tree, his wide-brimmed soft hat on his head, a cane in the right hand, while the left hand, resting on his right thigh, holds a magnifying glass. A. Maillard was the sculptor.

---

## General Catalogue of the Hemiptera.

The trustees of Smith College have agreed to undertake the publication of a catalogue of the Hemiptera of the world, as an item in the celebration of the fiftieth anniversary of the founding of the college. This work will appear in fascicles as the various specialists complete their portions.

At the last meeting of the American Association for the Advancement of Science (Cincinnati, 1923) a group of entomologists interested in the scheme suggested the organization of an editorial board for the catalogue as follows:

General Editor: Dr. G. Horvath, National Museum, Budapest, Hungary.

Managing Editor: Dr. H. M. Parshley, Smith College, Northampton, Mass.

Mr. H. G. Barber, Roselle, New Jersey.
Dr. E. Bergroth, Ekenäs, Finland.
Dr. C. J. Drake, Iowa State College.
Dr. W. D. Funkhouser, University of Kentucky.
Dr. H. B. Hungerford, University of Kansas.
Dr. H. H. Knight, Iowa State College.
Dr. Z. P. Metcalf, North Carolina State College.
Mr. J. R. de la Torre-Bueno, White Plains, New York.

Authorship of certain fascicles has been agreed upon and it

is expected that specialists in various countries will be found to complete the list. Perhaps what has always failed of completion as the effort of one or two authors will succeed as a work of international cooperation. The Latin, French, German, or English languages may be employed by authors. Persons interested in the catalogue are invited to communicate with the managing editor, either directly or through any member of the board.

The fascicles will be sold at a very moderate price, and it is hoped that individuals and institutions will make early indication of their intention (without legal obligation) to subscribe for the whole. Such subscribers will receive each fascicle promptly upon publication and thus assure themselves ultimate possession of the complete work.

H. M. PARSHLEY, Managing Editor, Smith College.

---

**Professor and Mrs. Cockerell Visit the Pacific Islands.**

Professor T. D. A. Cockerell wrote from Boulder, Colorado, Sept. 4, 1924: "I had a splendid trip, five weeks in Hawaiian Islands, visited islands of Oahu, Kauai and Hawaii. My wife had a much longer trip, to Tahiti, Rarotonga, New Zealand, Fiji Islands, Tonga Islands, Samoa (three weeks) and Honolulu. The collections we got are not large, but we have some interesting things."

---

**The Occurrence of Eurrhypara urticata Linnaeus (Lepidoptera: Hydrocampinae) in Maine.**

I have recently received for identification from Mr. John C. Parlin, Principal of the Freedom Academy, Freedom, Maine, several specimens of Hydrocampine moths, which turn out to be *Eurrhypara urticata* Linnæus. I have in my collection a small series of this pretty moth from Europe, purchased many years ago from the late Dr. Otto Staudinger, at a time when I had asked him to supply me with as complete a collection as possible of the Pyralidæ of Europe. A reference to the Catalog of the Lepidoptera of the Palæarctic Region, by Staudinger and Rebel (1901, pt. II, p. 50), gives the distribution of the species as "Europe (excepting the polar regions and (?Sicily), Asia Minor, Armenia, Western China, Amoorland."

Dyar in his "List of the Lepidoptera of North America" (1902) does not list the species. Barnes and McDonough, in their "Check-List of the Lepidoptera of Boreal America," p. 136, 1917, cite the species, but of course without reference to

locality. I have not had the time to thoroughly search through the entire literature of the subject, but, aside from the last mentioned citation, have failed to discover any reference to the species as occurring in North America. I am informed that on the occasion of a recent visit to the Carnegie Museum during my absence, my friend, Mr. W. T. M. Forbes, stated to Mr. Kahl that the species has been reported from Nova Scotia. The capture of the insect in some numbers during the past summer at Machias, Maine, therefore adds a new locality.

Whether the species has been recently introduced into America, or is indigenous, is a question. Being rather a conspicuous little moth, it appears singular that it should not have been noted long before this time, especially by such careful observers as Fernald, Scudder, Packard and others, who collected extensively in New England. The larva feeds upon nettles.—W. J. HOLLAND, Carnegie Museum, Pittsburgh, Pennsylvania.

## Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of the American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **6**—Journal of the New York Entomological Society. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **13**—Journal of Entomology and Zoology, Claremont, Cal. **20**—Bulletin de la Societe Entomologique de France, Paris. **21**—The Entomologist's Record, London. **22**—Bulletin of Entomological Research, London. **26**—Boletin de la Sociedad Entomologica de Espana, Zaragoza. **39**—The Florida En-

tomologist, Gainesville. **49**—Entomologische Mitteilungen, Berlin-Dahlem. **50**—Proceedings of the United States National Museum. **52**—Zoologischer Anzeiger, Leipzig. **55**—The Pan-Pacific Entomologist, San Francisco. **68**—Science, Garrison on the Hudson, N. Y. **69**—Comptes Rendus des Seances de l'Academie des Sciences, Paris. **70**—Journal of Morphology, Philadelphia. **76**—Nature, London. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **78**—Bulletin Biologique de la France et de la Belgique, Paris. **89**—Zoologische Jahrbucher, Jena. **90**—The American Naturalist, Lancaster, Pa. **92**—Archives de Zoologie Experimentale et Generale, Paris. **94**—The American Journal of Science, New Haven, Conn. **98**—Annals of Tropical Medicine and Parasitology, Liverpool. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **106**—Anales de la Sociedad Cientifica Argentina, Buenos Aires. **108**—Journal of Genetics, Cambridge, England. **118**—Die Naturwissenschaften, Berlin. **119**—Proceedings of the National Academy of Sciences of the U. S. A., Washington, D. C. **134**—Annales de Biologie Lacustre, Brussels. **141**—Internationale Entomologische Zeitschrift, Guben. **144**—Proceedings of the Pacific Coast Entomological Society, San Francisco. **150**—Jenaische zeitschrift fur naturwissenschaft, Jena. **151**—Occasional Papers of the Boston Society of Natural History.

**GENERAL.** **Crampton, G. C.**—The phylogeny and classification of insects. **13,** xvi, 33-47. **Davis, W. T.**—Cicada-killing wasps and flies. **6,** xxxii, 113. **Gerhardt, U.**—Versuch einer vergleichenden analyse des mannlichen geschlechtstriebes der tiere. (Zeit. f. d. Ges. Anat., Abt. 3, xxv, 661-95.) **Hanna, G. D.**—Insects in the California tar traps. **68,** lix, 555. **Heikertinger, F.**—Erwiderung an H. H. Karny, betreffend die "Anwendung der nomenklaturregeln." **49,** xiii, 109-10. **Herrera, M.**—Guia para visitar la coleccion de los aracnidos, miriapodos e insectos . . . (Secret. Agr. y Fomento, Mexico, 1923, 200 pp.) **Lovett, A. L.**—Obituary note. **12,** xvii, 421-2. **Lutz, F. E.**—Apparently non-selective characters and combinations of characters, including a study of ultraviolet in relation to the flower visiting habits of insects. (An. N. Y. Ac. Sci., xxix, 181-283.) **MacGillivray, A. D.**—Obituary note. **68,** lix, 503. **Moscher & Holbrook**—A device for inflating larvae. **12,** xvii, 408-11. **Prell, H.**—Ueber das ausschlupfen von insekten aus inada-

quaten kokons. **52,** lix, 241-56. **Reed, C. T.**—Insects simulate birds in flight. (Guide to Nat., xvii, 45.) **Tillyard, R. J.**—Kansas permian insects. Pt. 3, The new order Protohymenoptera. **94,** viii, 111-22. **Turner, C. H.**—An appreciation by A. G. Pohlman. The scientific work of. A list of papers published. By P. Rau. (Trans. Ac. Sc. St. Louis, xxiv, No. 9, 7-18.) **Turner, C. H.**—Tropisms in insect behavior. The psychology of "playing possum." (Trans. Ac. Sc. St. Louis, xxiv, No. 9, 19-26; 46-54.) **Walsh, G. B.**—The passage of apterous insect parasites, etc., from host to host. **8,** 1924. 143-4. **Weiss & West**—The insects and plants of a salt marsh on the costal plain of New Jersey. **6,** xxxii, 93-104.

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC.** **Blunck, u. Speyer**—Kopftausch und heilungsvermogen bei insekten. **104,** cxxiii, 156-208. **Bonnier, G.**—Contributions to the knowledge of intra- and inter-specific relationships in Drosophila. (Acta Zool., v, 1-122.) **Bretschneider, F.**—Ueber das gehirn eines barenspinners. (Callimorpha dominula, die jungfer.) **150,** lx, 147-73. **Buys, K. S.**—Adipose tissue in insects. **70,** xxxviii, 485-528. **Christophers, S. R.**—The tracheation and venation of the wing of the mosquito. (Indian Jour. Med. Res., xi, 1103-18.) **Crozier, W. J.**—Wave length of light and photic inhibition of stereotropism in tenebrio larvae. (Jour. Gen. Phys., vi, 647-52.) **Cunningham, J. T.**—Transplantation of heads of insects. **76,** cxiv, 124. **Duncan, C. D.**—Spiracles as sound producing organs. **55,** i, 42-3. **Engel, E. O.**—Das rectum der dipteren in morphologischer und histologischer hinsicht. **104,** cxxii, 503-33. **Geiser, S. W.**—The differential death rate of the sexes among animals, with a suggested explanation. (Wash. Univ. Stud., Sc. Ser., xii, 73-96.) **Hingston, R. W. G.**—The evolution of the faculty of communication in ants. (Rep. Proc. Fifth Ent. Meet., Pusa, 289-95.) **Hollande, A. C.**—Les spirochetes des termites; processus de division formation du schizoplaste. **92,** lxi, 23-34. **Hyde, R. R.**—Inbreeding, outbreeding, and selection with Drosophila melanogaster. **85,** xl, 181-215. **Keilin, D.**—On the appearance of gas in the tracheae of insects. (Pro. Cambr. Phil. Soc., Biol. Sc., i, 63-70.) **Kuhl, W.**—Eine methode zur herstellung von rasiermesserschnitten fur topographische ubersichtsbilder durch ganze insekten beliebiger grosse, ohne vorherige chitinaufweichung. (Zeit. Wiss. Mikroskopie, xl, 369-73.) **Lengerken, H.**—Prothetelie bei coleopterenlarven. (Meta-

thelie.) **52,** lix, 323-30. **de Luna, M.**—Sur la presence d'un ovaire accessoire chez Drosophila melanogaster. **69,** clxxviii, 2274-6. **Mavor & Svenson**—Crossingover in the second chromosome of Drosophila melanogaster in the $F_1$ generation of X-rayed females. **90,** lviii, 311-15. **Mercier, L.**—Geomyza sabulosa, microdiptere a ailes reduites; perte de la faculte du vol chez cette espece selon le processus drosophilien. **69,** clxxix, 221-3. **Nath, V.**—Cell inclusions in the gametogenesis of Scorpions. **76,** cxiv, 52. **Orlov, J.**—Die innervation des darmes der insekten. (Larven von Lamellicorniern.) **104,** cxxii, 425-502. **Pictet, A.**—La genetique experimentale dans ses rapports avec la variation et l'evolution. (Verh. Schweiz. Naturf. Ges., ciii, 133-68.) **Schulze, H.**—Uber die putztatigkeit von Habrobracon; zugleich ein beitrag zur sinnesphysiologie und psychologie dieser schlupwespe. **52,** lix, 313-23. **Seiler, J.**—Neue ergebnisse der chromosomenforschung. (Vehr. Schweiz. Naturf. Ges., cii, 84-94, 1921.) **Seitz, A.**—Zur phylogenie des insektenstammes. **144,** xli, 21-2. (cont.) **Seurat, L. G.**—Moeurs et evolution d'un Tipulide a larve et nymphe marines. (Bul. Soc. Hist. Nat. Afrique du Nord, 1924, 113-21.) **Tanaka, Y.**—A new sex linked mutation in the silkworm Bombyx mori. (Jour. Dept. Agr., Kyushu Imp. Univ., i, 135-50.) **Tonkov, V.**—Zur mikroskopischen anatomie der rectaldrusen bei den insekten. (Rev. Russe. Ent., xviii, 69-80.) **Weber, H.**—Das grundschema des pterygotenthorax. **52,** lx, 17-37; 57-83. **Wenyon, C. M.**—Microscopic parasites and their carriers. (Pro. R. Inst. Gr. Britain, xxiii, 503-21.) **Wright, W. R.**—On the function of the oesophageal diverticula in the adult female mosquito. **98,** xviii, 77-82. **Zawarzin, A.**—Zur morphologie der nervenzentren. Das bauchmark der insekten. **104,** cxxii, 323-424.

**ARACHNIDA AND MYRIOPODA. Barnes, H. F.**—On the occurrence of mites on crane-flies. **8,** 1924, 135-7. **Bertin, L.**—Les terrieres des araignees. La Nature, 1924, 330-54. **Chodziesner, M.**—Beitrage zur kenntnis der zecken mit besonderer berucksichtigung der gattung Hyalomma. **89,** xlvii, Syst., 505-72. **Cleaves, H. H.**—Spiders' ballast. (Nature Mag. iv, 48-9.) **Emerton, J. H.**—Recent collections of Canadian spiders. **4,** lvi, 122-4. **Thuringer, J. M.**—A note on migration of myriapoda. **68,** lx, 83.

***Chamberlain, J. C.**—The Cheiridiinae of North Am. **55,** i, 32-40. ***Emerton, J. H.**—New California spiders. **55,** i,

29-31. ***Ewing, H. E.**—A new mite from the lung sac of a rattlesnake. **10,** xxvi, 179. **Petrunkevitch, A.**—On families of spiders. (An. N. Y. Ac. Sc., xxix, 145-180.)

**THE SMALLER ORDERS OF INSECTA. Alverdes, F.**—Uber das verhalten von libellen- und eintagsfliegenlarven. **118,** xxviii, 575-6. **Freund, L.**—Zur literatur uber lause (Anoplura). (Naturw. Zeit. Lotos. lxx, 243-47.) **Jucci, C.**—La differenziazione de le caste ne la societa dei Termitidi. (Mem. R. Accad. Naz. Lincei, Cl. Sci. Fis., xiv, 500 pp.) **Klugh, A. B.**—Dragon flies and damsel flies. (Nature Mag., 1924, 107-9.) **Lall, H.**—External genitalia of Lahore dragonflies. (Rep. Proc. Fifth Ent. Meet., Pusa, 369-77.) **Lenz, F.**—(See under Diptera). **Macnamara, C.**—The food of Collembola. **4,** lvi, 99-105. **Samal, J.**—Etude morphologique et biologique de Perla abdominalis. **134,** xii, 229-72. **Stumper, R.**—Une termitiere singuliere. La Nature, 1924, 351-2. **Watson & Hubbell**—On a collection of Thysanoptera from Honduras. **39,** vii, 60-2.

**Hood, J. D.**—A new Seriothrips injurious to cotton. **4,** lvi, 149-50. **Longinos Navas, R. P.**—Crisopidos de Cuba. **26,** vii, 51-3.

**ORTHOPTERA. Koncek, S. K.**—Zur histologie der ruckendruse unserer einheimiscen Blattiden. **104,** cxxii, 311-22. **Lucas, W. J.**—Hibernation of Forficula auricularia. **9,** 1924, 140-1. **Rau, P.**—The biology of the roach, Blatta orientalis. (Trans. Ac. Sc. St. Louis, xxv, No. 9, 57-79.) **Rostand, J.**—Sur l'intersexualite chez les phasmes. **77,** xci, 448-9.

**Caudell, A. N.**—Amblycorypha brachyptera. 10, xxvi, 180.

**HEMIPTERA. Fernald, H. T.**—Giant water bug attacks trout. (Nature Mag., iv, 49.) **Ferris, G. F.**—The nymphs of two sps. of Chermidae. **55,** i, 24-8. **Patch, E. M.**—The summer food plants of the green apple aphid. (Bul. Maine Agr. Exp. Sta., 313.) **Ringuelet, E. J.**—Contribucion al estudio de la "Pulvinaria flavescens." **106,** xcvii, 61-80.

**de Costa Lima, A.**—Nota sobre as especies do genero Eucalymnatus. (Coccidae). (Arch. Esc. Sup. Agr. Med. Vet. Nictheroy, vii, 35-42.) **Green & Laing**—Descriptions of some apparently new non-diaspidine Coccidae. **22,** xiv, 415-19. ***Hungerford, H. B.**—A new Mesovelia with some biological notes regarding it. **4,** lvi, 142-44. ***Van Duzee, E. P.**—Characters of two No. Am. Chermidae. **55,** i, 22-3.

**LEPIDOPTERA. Blackmore, E. H.**—L. not previously recorded from British Columbia. Rare and uncommon L. taken in British Columbia during 1923. (Rep. Prov. Mus. N. H., Br. Col., 1923, C, 19-25.) **Burrows, C. R. N.**—Upon the suggested relationships of Psychids. **21,** 1924, 81-5 (cont.) **Ford, L. T.**—Lepidoptera and bats, **9,** 1924, 140. **Shepherd, J.**—Mass production. **9,** 1924, 141-2. **Tulloch, J. B. G.**—The hibernation of Pyrameis atalanta. **9,** 1924, 139. **Wynne, A.**—Lepidoptera and bats. **9,** 1924, 164.

***Barnes & Benjamin**—A new sphingid from Nevada. **10,** xxvi, 166. ***Davis, W. T.**—A northern form of the butterfly Neonympha areolatus. **6,** xxxii, 105-8. ***Hall, G. C.**—Notes on Polygonia j-album, Crecyonis alope, Phyciodes tharos, Heodes epixanthe and Euphydryas gilletti. **6,** xxxii, 109-12. **Lathy, P. I.**—Notes on the genus Agrias. **11,** xiv, 144-56. **Moreau, E.**—Description de Papilio maroni de Guyane Francaise. **20,** 1924, 93-6. **Niepelt, W.**—Neue formen exotischer Rhopaloceren. **141,** xviii, 49-50. **Schaus, W.**—A new moth injurious to cocoanut palm (Limacodidae). **10,** xxvi, 180. **Schaus, W.**—New sps. of moths in the U. S. Nat. Mus. **50,** lxv, Art. 7. ***Skinner & Williams**—On the male genitalia of the Hesperiidae of North America. Paper IV. **2,** 1, 57-74.

**DIPTERA. Lenz, F.**—Eine konvergenzerscheinung beim gehausebau der Chironomiden- und der Trichopterenlarven. **52,** lx, 105-111. **Melin, D.**—Contributions to the knowledge of the biology, metamorphosis and distribution of the Swedish Asilids, in relation to the whole family of Asilidae. (Zool. Bidr. Fran Uppsala, viii, 1-317.) **Ramachandra Rao, Y.**—The genitalia of certain anthomyiid flies. (Atherigona spp.). (Rep. Proc. Fifth Ent. Meet., Pusa, 330-35.) **Saunders, L. G.**—An unusual case of sexual dimorphism in Ceratopogonine midges. **8,** 1924, 133-4. **Thompson, W. R.**—Recherches sur les dipteres parasites. Les larves des Sarcophagides. **78,** liv, 313-465.

**Aldrich, J. M.**—A n. g. and sp. of two-winged flies of the family Chloropidae injuring manihot in Brazil. **50,** lxv, Art. 21. ***Allen, H. W.**—Notes on Miltogramminae with descriptions of two n. sps. **151,** v, 89-92. ***Cole, F. R.**—Notes on the dipterous family Asilidae, with descriptions of n. sps. **55,** i, 7-13. ***Curran, C. H.**—A n. sp. of Nothosympycnus with synopsis of Canadian sps. Seven n. sps. of Rhaphium.

(Dolichopodidae). **4,** lvi, 108-10; 133-41. **Enderlein, G.**—Beitrage zur kenntnis der Platystominen. (Mitt. Zool. Mus. Berlin, xi, 97-153.) ***Johnson, C. W.**—A review of the New England species of Chysotoxum. **151,** v, 97-100. ***Malloch, J. R.**—Two new cordylurid flies from the Pacific coast. **55,** i, 14-15. ***Shannon, R. C.**—Change of preoccupied name. **10,** xxvi, 178. ***Van Duzee, M. C.**—A new western Dolichopodid. **55,** i, 43-4. ***Van Duzee, M. C.**—N. sps. of the dipterous family Dolichopodidae. **151,** v, 101-6. **Wheeler, W. M.**—Two extraordinary larval myrmecophiles from Panama. **119,** x, 237-44.

**COLEOPTERA. Arendsen Hein, S. A.**—Studies on variation in the meal worm, Tenebrio molitor. **108,** xiv, 1-38. **Bondar, G.**—Biologia do genero Collabismus (Curculionidae). (Arch. Esc. Sup. Agr. Med. Vet., Nichtheroy, vii, 23-4.) **Good, H. G.**—Notes on the life history of Prionocyphon limbatus. (Helodidae). **6,** xxxii, 79-84. **St. George, R. A.**—Studies on the larvae of N. A. beetles of the subf. Tenebrioninae with a description of the larva and pupa of Merinus laevis. **50,** lxv, Art. 1.

**Barber, H. S.**—New Ptiliidae related to the smallest known beetle. **10,** xxvi, 167-78. ***Blaisdell, F. E.**—Studies in the Melyridae. III. **55,** i, 15-21. ***Casey, T. L.**—Additions to the known C. of North America. (Mem. of the Coleoptera, xi, 347 pp.) ***Chittenden, F. H.**—New sps. and var. of Sphenophorus with notes on certain other forms. **10,** xxvi, 145-59. **Csiki, E.**—Coleopterorum catalogus. Pars 77: Serropalpidae, 62 pp. ***Fall, H. C.**—New sps. of North Am. Hydrobiini. **6,** xxxii, 85-92. **Heller, K. M.**—Ein neuer Leptinopterus. (Lucanidae). **49,** xiii, 63-4. **Knisch, A.**—Coleopterorum catalogus. Pars 79: Hydrophilidae, 306 pp. **Olsufiev, G.**—Silphopsyllus desmanae gen. et sp. nn., parasite du rat musque. (Leptinidae). (Rev. Russe Ent., xviii, 81-90.) **Pic, M.**—Melanges exotico-entomologiques. Fasc. 41. ***Swaine, J. M.**—N. sps. of the genus Phloeosinus. **4,** lvi, 144-9. ***Van Dyke, E. C.**—N. sps. and subsps. of Cychrini from western No. Am. (Carabidae). **55,** i, 1-6. ***Wallis, J. B.**—Two n. sps. of Coelambus (Dytiscidae). **4,** lvi, 105-8. **Weise, J.**—Coleopterorum catalogus Pars 78: Chrysomelidae: Galerucinae, 225 pp.

**HYMENOPTERA. Hase, A.**—Beitrage zur kenntnis des geschlechtslebens mannlicher schlupfwespen. Arb. Biol. Reichs. f. Land-u. Forstw., Berlin, xii, 339-46.) **Plath, O. E.**

—Miscellaneous biological observations on bumblebees. **100,** xlvii, 65-78. **Turner, C. H.**—The homing of the H. (Trans. Ac. Sc. St. Louis, xxiv, No. 9, 27-45.)

**Cockerell, T. D. A.**—Descriptions and records of bees.—CI. **11,** xiv, 179-85. **Duncan, C. D.**—Dolichovespa diabolica and its supposed var. fernaldi. **55,** i, 40-2. ***Fouts, R. M.**—New bethylid and serphoid parasites from No. Am. **10,** xxvi, 159-66. ***Fouts, R. M.**—Revision of the No. Am. wasps of the subfamily Platygasterinae. **50,** lxiii, Art. 15a. ***Gahan, A. B.**—Some new parasitic H. with notes on several described forms. **50,** lxv, Art. 4. ***Mickel, C. E.**—A revision of the Mutillid wasps of the genera Myrmilloides and Pseudomethoca occurring in America north of Mexico. **50,** lxiv, Art. 15. ***Viereck, H. L.**—Descriptions of new H. in the Canadian Nat. Coll., Ottawa. **4,** lvi, 110-12.

## SPECIAL NOTICES.

**L'Abeille,** Journal d'Entomologie, publie par la Societe Entomologique de France. We note the continuation of this long interrupted journal under the direction of R. Jeannel. It had not been issued since 1914. The present number is No. 1 of Tom. XXXII, and is large octavo size, containing a paper of 160 pp., by R. Jeannel: Revision des "Choleva" Latreille.

**Aphididae of Formosa,** Part 1-2. By Ryoichi Takahashi. Published by the Agr. Exp. Station, Gov. of Formosa, Taihoku, Formosa. American students may find this work of interest. It is in English; includes notes on many species occurring in North America and other parts of the World. Copiously illustrated with line cuts.

**Memoirs of the Coleoptera** by Thos. L. Casey, Part XI, 347 pp. This part of the well known memoirs contains many descriptions of new forms in several families of this order.

**Pan-Pacific Entomologist.** Published by the Pacific Coast Entomological Society in co-operation with the California Academy of Sciences. No. 1 of Vol. I has just appeared, and contains many papers describing new North American species, all of which are noted above. The numbers of this new journal are to be issued quarterly, and are intended to supply the need of an organ to represent the entomologists of the west coast region in their special branch of scientific research. The subscription price has been fixed at $2.00 per year, and the support of all entomologists upon the threshhold of the great Pacific region is solicited.

# Doings of Societies.

The Fifth Annual Summer Meeting of the Northeastern Entomologists, a section of the American Association of Economic Entomologists, was held at Philadelphia, Pennsylvania, and vicinity on Wednesday, Thursday and Friday, July 30 and 31 and August 1, 1924. Members and others interested gathered in the morning of July 30 at the Japanese Beetle Laboratory, Riverton, New Jersey, inspected the work there, had luncheon at the Riverton Country Club, where they listened to reports by Mr. Loren B. Smith and his associates of the Laboratory, and then visited peach, apple and cherry orchards near by, where excellent opportunity was afforded to witness the attacks of this insect as well as the protection afforded by arsenate of lead spraying against it. The same day at 8 P. M. a joint meeting with the Entomological Section of the Academy of Natural Sciences of Philadelphia was held in the Academy's building, at which addresses were made by the Hon. J. M. McKee, Deputy Secretary of Agriculture of Pennsylvania, President A. F. Burgess on his recent trip to the Pacific Coast and Mr. J. L. King on his experiences in Japan in search of parasites of the Japanese beetle.

On July 31, leaving Frankford, Philadelphia, at 8.30 A. M., visits were made by automobile to the Field Laboratory, Pennsylvania State College at Bustleton, the Fleming farm at Andalusia, the Willow Grove Joint Station of the Federal Bureau of Entomology and Penna. Bureau of Plant Industry, the DeKalb Nurseries, at Penn Square, and the Heyman orchard near West Chester, all in Pennsylvania, viewing various economic entomological projects in operation. Supper was at Westtown, as guests of the Chester-Delaware County Fruit-growers' Association.

On August 1, proceeding from West Chester, Penna., where most of the party spent the night, via Wilmington, Delaware, and (by ferry) Pennsgrove, New Jersey, to Bridgeton, the peach orchards of the Seabrook Farms were visited for the Oriental peach bud moth, Glassboro for potato injuries and thence to Camden where the party broke up.

This enjoyable and instructive session was planned and guided by Prof. H. E. Hodgkiss and Director C. H. Hadley (Bureau of Plant Industry) for Pennsylvania, and Prof. T. J. Headlee for New Jersey, to whom, and to the speakers mentioned, and those in charge of the various stations and farms, the thanks of the participants are due.

---

As was widely announced in the daily press and elsewhere, the British Association for the Advancement of Science held

its Ninety-second Annual Meeting in Toronto, Canada, August 6-13. The *Journal of Scientific Transactions* of the sessions, date July 7, 1924, a pamphlet of 107 pages, listed the papers to be presented, many of them accompanied by abstracts. The titles relating to Entomology follow. Presidential address by Maj. Gen. Sir David Bruce on Prevention of Disease (published in *Science* for Aug. 8, pp. 109-124). The following seven were scheduled for Section D. Zoology: F. A. Potts—Intracellular Digestion in Invertebrates; Dr. J. W. Heslop Harrison—On Hybrids between British and Canadian Lepidoptera; A. D. Peacock—Sexuality in the Saw-fly (Pristiphora pallipes Lep.), a study in the evolution of parthenogenesis; Dr. F. A. Dixey—On scent-distributing structures in the Lepidoptera; Prof. A. E. Cameron—Some Tabanidae of Saskatchewan, their parasites and hitherto undescribed pre-imaginal and imaginal stages; Prof. E. M. Walker and Miss Norma Ford—Some features in the anatomy of Grylloblata, a primitive Orthopteroid insect; J. M. Swaine—The factors determining the distribution of North American bark beetles; and the following for Section K. Botany: Dr. J. M. Swaine—Forest protection from insects.

## OBITUARY.

PHILIPPE GROUVELLE died August 2, 1923, at the age of 72 years. He was secretary of the Entomological Society of France 1904-1913 and a specialist in Coleoptera. (Bull. of that Society 1923, No. 15.)

JULES GROUVELLE, also a Coleopterist and member of the same society, died November 6, 1923, in his 83rd year. (Bull. cit. 1923, No. 17.)

The death of EDMOND BORDAGE, date not given, was announced at the meeting of the same society on February 13, 1924. He worked for a long time in the laboratories of Alphonse Milne-Edwards and Emile Blanchard in the Museum of Natural History (Paris) and was for some years director of the experimental garden in the Island of Reunion. He published on autotomy and regeneration in the Phasmidae and, under the title *Notes biologiques recueillies a la Reunion*, very varied observations on the instincts of the Spheginae, the habits of Evaniidae and Chalcididae parasitic on certain roaches, descriptions of Coccidae injurious to cultivated plants, acclima-

tation of species foreign to that island, etc. On his return to France, in 1908, he became chef de travaux in the laboratory of evolution, a position which he refused to leave when higher posts more suited to his merits were offered to him. He was not ambitious and preferred a modest situation which permitted him to work in peace. He was an excellent naturalist who published little because he was scrupulous and meticulous, but whose work, which remains entire, is of the greatest interest. (President F. Picard, Bull. cit. 1924, p. 33.)

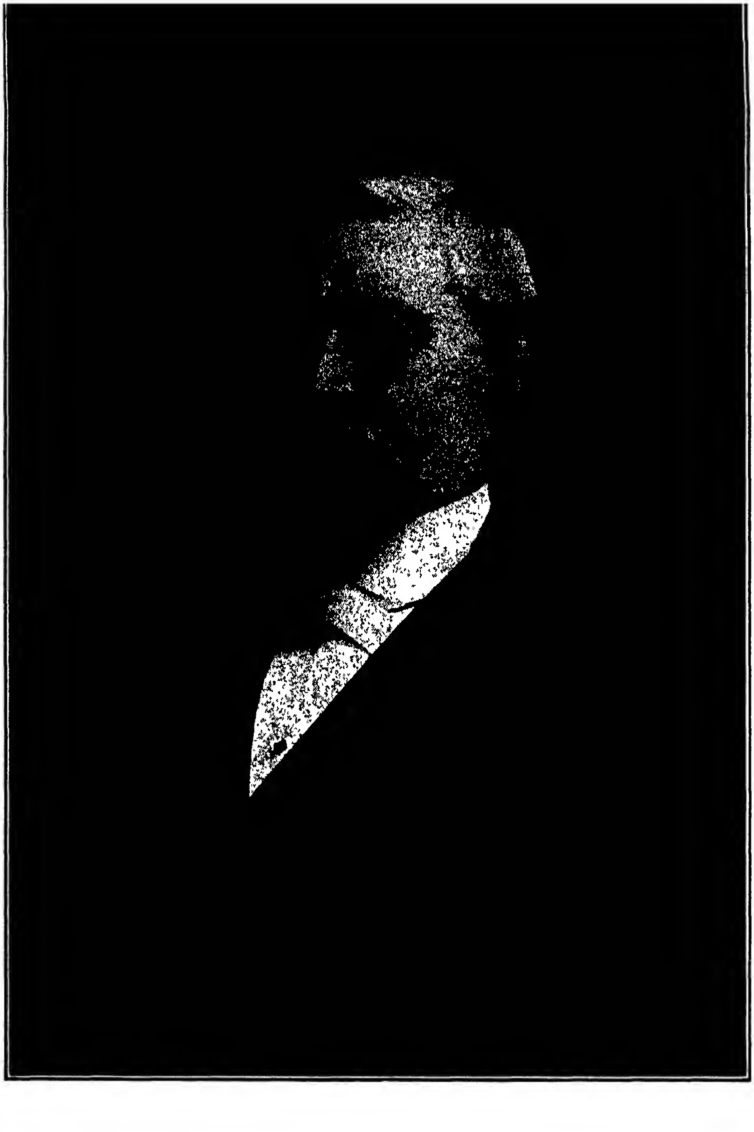
---

FREDERICK MERRIFIELD died May 28, 1924, at Brighton, England, at the age of 93 years. Son of a barrister of the Middle Temple and of Mary Philadelphia Merrifield, "a lady of great mental power and versatility, an accomplished naturalist and well known during her lifetime as a leading authority on the Algae, he undoubtedly derived [from her] the love of nature in all its aspects which was characteristic of the whole of his prolonged life." He was called to the bar in November, 1853; in later years he was clerk of the peace for Brighton.

Between 1887 and 1897 he conducted researches on the modification of Lepidoptera when reared under various conditions of temperature and of other surroundings, undertaken in the first instance on behalf of the late Francis Galton. They include the changes which may be induced by heat and cold acting upon the two generations of *Vanessa* (*Araschnia*) *levana-prorsa.* His results were published in the Transactions of the Entomological Society of London and are summarized by Dr. F. A. Dixey in *Nature* for Dec. 23, 1897, pages 184-188, and to a certain extent by himself in his paper *Experimental Entomology. Factors in Seasonal Dimorphism*, read to the First International Congress of Entomology, at Brussels, 1910, and published in the Memoirs thereof (pp. 433-448). Merrifield was President of the Entomological Society of London for 1905 and 1906. (Ent. Mo. Mag., July, 1924.)

---

DR. DAVID M. CASTLE, well known for his work on Coleoptera, a long-time member of the American Entomological Society and of the Feldman Collecting Social, died in Philadelphia, August 6, 1924. We hope to publish a more extended notice in our next number.



Dr. DAVID MacFARLAND CASTLE.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV NOVEMBER, 1924 No. 9

CONTENTS



## Dr. David MacFarland Castle.

(Portrait, Plate IX.)

DR. DAVID MACFARLAND CASTLE died August 15th, 1924, at his home, 2007 Arch Street, Philadelphia, following an illness of several months. He was in his eighty-second year.

Dr. Castle was born October 7th, 1842, at Lower Paxton Township, Dauphin County, Pennsylvania, and was graduated from Palmyra Academy in 1862. He later attended Hahnemann Medical College, in Philadelphia, graduating in the class of 1873.

For a number of years he was in charge of Hahnemann College dispensary and was Assistant Professor and Lecturer on Obstetrics.

As well as I can remember I became acquainted with Dr. Castle in 1874 or '75, when he visited my grandfather, Mr. Henry Feldman, I well remember the doctor's early collec-

tions, kept in cigar boxes which were highly polished and decorated with colored flowers cut from magazines and periodicals. During the Centennial Exposition, in 1876, the doctor and myself would visit on Friday afternoons the various entomological exhibits of foreign countries and buy gorgeous, colored insects at the Brazilian exhibit.

Dr. Castle never published any papers in entomology, devoting his entire time to field work, and became the possessor of much reliable information, which he imparted to his associates. The doctor made many collecting trips to his favorite Florida, and his rich captures were divided among his entomological friends.

In December, 1887, Dr. Castle was appointed Chairman of a Committee to draft a Constitution and By-Laws of the newly-formed Feldman Collecting Social. He served as Secretary of the Social from January, 1889, to January, 1893, and as President from January, 1898, to January, 1901.

He was a member of the Academy of Natural Sciences of Philadelphia, the Entomological Section of the Academy, and the American Entomological Society.

His death is a great loss to the members of the Feldman Social, whose meetings he never failed to attend. To have known him was a great privilege.

H. W. WENZEL.

## Life History of Heodes helloides Bdv. (Lepid.: Lycaenidae).

By KARL R. COOLIDGE, Hollywood, California.

*Heodes helloides* is the common "Copper" butterfly of the west, ranging everywhere from along the seashore up into the high mountains. About Los Angeles two species of butterflies are commonly seen disporting about the city lawns; one being *Hylephila phylaeus* and the other *helloides*.

Here it makes its first appearance in early March; about the middle of April comes another brood; in late June another is in full flight; a fourth in July. Then from August to November, when the butterfly is far more abundant than in earlier

months, as near as I can judge, three more broods occur, making seven in all. Hibernation is passed in the chrysalis state. The food-plants are:

POLYGONACEAE: *Polygonum* sp.—In the cities, on the lawns and in parks, on *P. aviculare* Linn., the notorious wire-grass. No doubt any species of *Polygonum* will suffice as food, and I have found eggs or larvae on *P. lapathifolium* Linn. and *P. hydropiperoides* Michx.

*Rumex* sp.—Probably also any of the numerous species of this genus are satisfactory as food-plants. In Southern California I have located the following definitely: *P. persicarioides* Linn., *P. conglomeratus* Murr., *P. crispus* Linn., and *P. hymenosepalus* Torr., this latter the canaigre of commerce.

*Oxytheca sperguliṇa.*—This and the following on the authority of Miss Ximena McGlashan (Diurnal Food-Plant Chart, 1913).

ONAGRACEAE: *Gayophytum diffusum.*—Small flowered evening primrose.

A time record of the transitions follows:

Eggs laid May 25th and 26th.
Hatched June 4th.
Larvae passed first moult June 17th.
Larvae passed second moult June 23rd.
Larvae passed third moult June 28th.
Larvae passed fourth moult July 7th.
Suspended July 15th.
Pupae disclosed July 17th.
Imagoes emerged July 27th.

The young larvae invariably escape by eating out roundish jagged holes in the summit of the egg, about .30 mm. in diameter, only devouring enough of the shell to make their egress.

They attack both upper and lower surfaces of the leaves, but perhaps show a preference for the lower side. In the first stages the larvae bite roundish holes into the leaves, eating only about half-way through the parenchyma, and also ploughing narrow furrows along the surface. But after the second moult they eat clear through the leaf, and following the next moult will devour the leaf at its edge. The larvae are sluggish, remaining on a leaf for a considerable length of time, even after it has dried up, apparently too lazy to venture forth for fresher food, and completely riddling a leaf before leaving it. Pupation occurs in debris about the base of the food-plant.

*The Egg.*—In form tiarate, a little more rounded above than below, with the base broadly truncate. The micropyle in a deep circular depression, with abrupt walls, .08 mm. in diameter, dark green, showing rather prominently to the naked eye. The micropyle rosette occupying the whole floor of the cavity and consisting of a central roundish cell, .001 mm. in diameter, with a group of larger circular or suboval cells surrounding it. The network of these micropylar cells exceedingly minutely raised and very indistinct.

The surface of egg covered with a raised white network, the walls of which average about .015 mm. in thickness. This network divides itself into mostly subquadrate or triangular cells, about .04 mm. in their greatest diameter. The cell walls, at their junctures, enlarge into the usual rounded conical protuberances, which produce the effect of stellate ridges. On the sides the cells are disposed with some regularity, the protuberances prominently six-rayed, but as the micropylar region is approached and reached the arrangement becomes more and more confused, the rays diminishing and the cells becoming oval and roundish, and much smaller. The surface of all the cells delicately punctuate. The protuberances about .03 mm. in height, with the connecting cell walls mounting to about half this height.

Color of egg a delicate pale green, after three or four days of incubation fading into a chalky white; the raised network and protuberances glistening white. Height, .36 mm. Breadth, .66 mm.

*Larva, First Instar.*—Head smooth, shining, pale amber brown; ocellar field blackish fuscous; edge of labrum and mouth parts tinged with ferruginous. Diameter of head, .24 mm.

Body largest anteriorly, well rounded posteriorly, a little depressed above and very much so below. First thoracic segment with a double row of colorless, pointed, spiculiferous hairs projecting over the head, some as long as .36 mm., others but .16 mm. Other segments with a subdorsal row of hairs, two to a segment, arising from slender but high fuscous papillae, .04 mm. in height. The central hair long, .40 mm. in length, .02 mm. in diameter at base, curving sweepingly posteriorly. The second hair posterior and a little outside the first, much shorter, only .10 mm. in length, nearly straight, depressed, also projecting posteriorly. Both these hairs colorless, tapering to a fine point and minutely spiculiferous. A ventrostigmatal row of hairs, three to a segment on either side, projected from low slender tubercles. The first hair .12 mm. in length; the second .16 mm.; the third but .06 mm. These hairs fairly straight, colorless, pointed, spiculiferous, projecting posteriorly. A series of sub-

dorsal, circular, crateriform papillae, one to a segment on either side, .02 mm. in diameter, centrally located. A similar but smaller infrastigmatal series of papillae, also centrally located. Stigmata oval, .015 mm. in length, with a fine fuscous ring.

Color, a rather vivid lemon yellow, with a whitish sheen especially prominent dorsally. But as the larvae feed they become more and more greenish, until at the end of the instar they are a uniform grass green. Ventral surface, legs and prolegs bright lemon yellow. Length 1.14 mm. Width at first thoracic segment .34 mm.; width at anal segment .28 mm.

*Second Instar.*—Head smooth, pale amber brown, .44 in diameter, with the ocellar field black and the mouth parts reddish.

On first thoracic segment a heavy fringe of hairs arising from tubercles concolorous with body; these hairs project over the head, are colorless, sharp, spiculiferous, and vary in length from .10 mm. to .30 mm. On the anal segment a similar fringe, but not as profuse. Laterally, just above the spiracles and a little back of them, a short, rather stout, sharp, straight hair, but .10 mm. in length and densely spiculiferous; in line with this a second similar hair, on hind edge of segment. Substigmatally, along ventral ridge, a number of colorless, sharp, spiculiferous hairs, averaging .18 mm. in length. First subdorsals now .36 mm. in length, arising from pale green tubercles, .02 mm. in diameter at base and but slightly higher; the hairs curved as before, spiculiferous and infuscated. Second subdorsals .18 mm. in length. Spiracles round, .02 mm. in diameter, with a pale brown ring.

Color of body, pale green. Dorsally, on either side of line of dorsal vessel, a white streak, wide, but not connected in the form of a continuous definite stripe, and not at all prominent; and on either side of this an illy defined, poorly connected, yellowish, crenate stripe. Along ventral ridge a sordid white stripe. Ventral surface and prolegs pallid green; legs subhyaline, pale yellow brown.

Length, 3.50 mm. Width at first thoracic segment .90 mm.; width at anal segment .80 mm.

*Third Instar.*—Head smooth, pale amber brown, .64 mm. in diameter; ocellar field black; mouth parts fuscous.

Ventral ridge with a fringe of numerous irregular hairs, arising from minute tubercles. These hairs vary in size from .10 mm. to .30 mm., are coarsely spiculiferous, pointed, and nearly all are colorless, with only a few, especially the hairs as in previous stage subdorsally, tinged with fuscous. The tubercles from which they arise very delicate pale green, sometimes fuscous tinged, and averaging about .03 mm. in height and diam-

eter at base. First thoracic and anal segments with fringes of colorless sharp hairs as along ventral ridge. Spiracles round, .04 mm. in diameter, with a pale brown ring, conspicuous against the body ground color.

Color of body, grass green. Stripes as in second instar, but still inconspicuous. In some examples a rather prominent ventrostigmatal stripe of bluish white develops, and the line of the dorsal vessel may be of a deeper green than rest of body. Ventral surface concolorous with body; prolegs blue green; legs subhyaline, pale yellow brown.

Length, 4.70 mm. Width at first thoracic segment 1.20 mm.; width at anal segment 1 mm.

*Fourth Instar.*—Head smooth, pale amber brown, 1. mm. in diameter; ocellar field black; mouth parts infuscated. A few hairs on lower front face, sharp and colorless; several .25 mm. in length, a number but .10 mm. long, and a few very short ones only .04 mm.

Body rather thickly covered with numerous, irregularly scattered, sharp hairs, arising from minute tubercles; these hairs varying in size, from .20 mm. in length down to .10 mm. They are rather coarsely spiculiferous, for the most part colorless, with only a few infuscated. The tubercles from which they arise very minute, about .017 mm. in height and diameter at base, and concolorous with body. Along ventral ridge, and extending around first thoracic and anal segments, the hairs are much longer, some .40 mm. in length, and arranged in a rather dense fringe. In addition to warts projecting hairs, numerous, irregularly scattered, spiny, bulbous processes, glistening white, .04 mm. in height. Spiracles round, .06 mm. in diameter, with a pale brown ring.

Color of body, grass green. Stripes as before, and in addition, a rather fine, yellowish, infrastigmatal stripe, weak and inconspicuous usually, but occasionally well developed, and sometimes blue-white. Ventral surface concolorous with body; prolegs blue green; legs subhyaline, pale yellow brown.

Length, 5.80 mm. Width at first thoracic segment 1.60 mm. Width at anal segment 1.30 mm.

*Fifth Instar.*—Head 2.30 mm. in diameter, pale amber brown, smooth, except for a few sharp colorless hairs on lower frontal face, several of these .30 mm. in length, shorter ones down to .10 mm. Mouth parts reddish fuscous; eyes white in a black field.

Viewed from above, elongate elliptical, rounded anteriorly, a little more bluntly than posteriorly, and but scarcely tapering posteriorly. Ventrally flattened, with the legs and prolegs short and stout.

As before, body rather thickly covered with numerous irregularly scattered sharp hairs, arising from minute tubercles; these hairs varying in size from the longest, .60 mm., down to others but .20 mm. The tubercles from which they arise very small, the largest only .02 mm. in height and diameter at base, and concolorous with body. The hairs mostly colorless, only a few infuscated, and all coarsely spiculiferous. Hairs along ventral ridge, and extending around first thoracic and anal segments longer than elsewhere, in a rather dense fringe. Numerous irregularly scattered, spiny, bulbous processes as before, glistening white, .045 mm. in height. Spiracles subovate, .14 mm. in length, pallid, with a fine brown ring.

Color of body, grass green. An infrastigmatal yellowish stripe, as in previous stage, still weak and inconspicuous. On either side of dorsal line, except on first thoracic and anal segments, a poorly connected, fine, streak-like line of bright yellow, too weak to be at all prominent. On the sides a line of yellow oblique dashes, even less conspicuous. Ventral surface concolorous with above; prolegs blue green; legs subhyaline pale yellow brown.

Length, at start of instar, 9.6 mm.; at maturity, 14. mm. Width at first thoracic segment 2.30 mm.; at maturity, 2.70 mm. Width at anal segment 2. mm.; at maturity, 2.40 mm.

*Pupa.*—Viewed from above, the sides, from one end of wing cases to the other, straight except for a slight divergence at abdominal segment four, where the greatest width occurs. Thorax from basal wing tubercles only slightly decreasing to anterior extremity, which is quite sharply truncate. Abdomen elliptical well rounded posteriorly.

Viewed laterally, the highest point is thoracic segment three, sloping rapidly thence forward, but dipping only slightly at point of junction with abdomen. Abdomen arched, evenly rounded to last segment, which drops off abruptly and is nearly perpendicular. Ventrally, uniformly flattened.

Body covered with a very delicate, scarcely perceptible tracery of very low, equal, raised lines, crossing irregularly and forming rather large irregular, angular cells; at the junction of these lines a slight enlargement takes place so as to form a low naked wart. Tracery concolorous with body. Within the tracery cells, profusely and irregularly scattered, are very pale greenish low warts giving rise to glistening white fungiform bristles; these bristles vary slightly in size, averaging .08 mm. in length; their stalks .018 mm. in diameter at base, straight for three-fourths their distance, then suddenly expanding into flattened infundibuliform discs, .06 mm. across, with their horizontal

edges fringed with fleshy ciliate lobes. These bristles lacking on the ventral surface, except for a short distance from both anterior and posterior ends. Hooklets of cremaster .08 mm. in length, long and slender, their stems equal, but expanded at extremities into mushroom-like saucers, .04 mm. across; in color rather bright reddish brown.

Spiracles elongate oval, elevated, white, with a rather sharp concolorous ring, .12 mm. in length, .06 mm. across; to the naked eye with an aureous tinge. Basal wing prominences low, broadly rounded elevations, glistening white, .12 mm. in height and of the same diameter at base.

Color of thorax, grass green; of abdomen, yellow green. Wing cases pale cream colored, with some blackish fuscous streaks on outer borders. Tongue case infuscated with weak, brownish streaks. Tongue and antennal cases outlined in weak brown. A fine black dorsal streak, on thoracic segments heavier than abdominally, and on abdominals containing a rather heavy point. At point of junction of thorax and abdomen the dorsal line slightly enlarged, and on either side of it here, laterally on mesothorax, a rather long, wavy, black streak. On first thoracic, on either side of dorsal line, a fine black point. Suprastigmatally, on abdominal segments, in line with wavy streaks of mesothorax, a weak series of brown points, two to a segment in an oblique row. Between dorsal line and lateral points of abdomen, a subdorsal series of very weak black points, almost obscure, one to a segment placed posteriorly.

Length, 10.5 mm. Greatest width of thorax, 4. mm.; greatest width of abdomen, 4.50 mm. Greatest height of thorax, 4. mm.; greatest height of abdomen 3.75 mm.

## New Thysanoptera from the United States.

By J. DOUGLAS HOOD, University of Rochester.

(The types of the new species described below are in the author's collection).

**Sericothrips nubilipennis** sp. nov.

♀ (macropterous).—Length about 1 mm. Color nearly uniform pale yellow, with a pair of large brown spots at center of prothorax and another somewhat smaller pair on metascutum; antennæ concolorous with body, excepting sides of 2, which are slightly darkened, and distal two-fifths of 4, distal half of 5, and all of 6-8, which are dark blackish brown; fore wings nearly uniform dark blackish brown, slightly paler at

extreme tip, just beyond scale, and also along anterior margin in basal fifth; legs concolorous with body; ocellar pigment deep red.

Head about 1.7 times as wide as long, about as broad across eyes as behind them, surface without noticeable sculpture, bristles as usual in the genus. Eyes rather large and rounded, equal in width to their interval, pilose. Antennæ about three times as long as head. Mouth cone only slightly surpassing base of prosternum.

Prothorax decidedly longer than head and about 1.7 times as wide as long, sides broadly rounded; pronotum with the usual, raised, anastomosing, transverse lines and with the single large bristle at posterior angles straight, pale, and not prominent. Fore wings with all bristles dark in color and readily visible; costal margin with 26 bristles; principal vein with a basal group of three, then with 20, the last one rather more widely separated than the others; posterior vein indicated by two widely spaced bristles near tip of wing; hind wings with dark median line except at tip and base.

Abdomen rather slender but distinctly wider than pterothorax, without color markings of any kind; sides with the usual pubescence, which is missing from median portion; all bristles slender, pale, and very inconspicuous.

Measurements of holotype: Length 1.00 mm.; head, length about 0.084 mm., width 0.143 mm.; prothorax, length about 0.107 mm., width 0.180 mm.; pterothorax, width 0.225 mm.; abdomen, width 0.255 mm.; fore wings, length 0.690 mm.; width at middle, 0.030 mm.; near base, 0.060 mm.

| Antennal segments | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Length (microns) ... | 21 | 36 | 42 | 43 | 40 | 46 | 10 | 13 |
| Width (microns) .... | 24 | 26 | 19 | 18 | 17 | 16 | 7 | 5 |

Total length of antenna, 0.25 mm.

Described from one female taken by Mr. W. L. McAtee, of the U. S. Biological Survey, and the writer at Plummer's Island, Maryland (in the Potomac River above Washington, D. C.), from willow, October 5, 1913.

A very pretty and unusually colored species, easily known by the dark wings.

**Sericothrips sambuci** sp. nov.

♀ (macropterous).—Length about 1.1 mm. Color uniform pale yellow, nearly white, without body markings of any sort; antennæ light gray, with segment 1 nearly clear white, 2 somewhat infuscate, 4 dark gray in distal third, 5 dark gray in distal

half or more, and 6-8 nearly uniform dark gray; wings with veins and fringes slightly yellowish, otherwise colorless except for a very light shading at basal third; legs concolorous with body; ocellar pigment bright red.

Head about 1.75 times as wide as long, somewhat broader across eyes than behind them, surface without noticeable sculpture, bristles as usual in the genus. Eyes relatively small, rounded, widely separated, only a little more than half as wide as their interval, pilose. Antennæ about three times as long as head, segments as usual in this group of the genus. Mouth cone short, not at all prominently tipped with black, barely attaining base of prosternum.

Prothorax decidedly longer than head and about 1.5 times as wide as long, sides broadly rounded; pronotum with the usual raised, anastomosing, transverse lines and with the single large bristle at posterior angles nearly straight and colorless. Fore wings with all bristles pale in color and inconspicuous; costal margin with about 26 bristles; principal vein with a basal group of three followed by about 20, the distal one or more rather widely separated; no additional bristles in a second series at tip of wing; hind wings without median dark line.

Abdomen rather slender, but decidedly wider than pterothorax, without color markings; sides with the usual pubescence, which is missing from median portion; all bristles slender, pale, and very inconspicuous.

Measurements of holotype: Length 1.13 mm.; head, length 0.090 mm., width 0.158 mm.; eyes, length 0.054 mm., width 0.041 mm., interval 0.075 mm.; prothorax, length 0.123 mm., width 0.180 mm.; pterothorax, width 0.255 mm.; abdomen, width 0.315 mm.; fore wings, length 0.750 mm., width at middle 0.036 mm., greatest subbasal width 0.075 mm.

| Antennal segments | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Length (microns) ... | 18 | 39 | 52 | 50 | 43 | 51 | 12 | 15 |
| Width (microns) .... | 26 | 28 | 22 | 20 | 20 | 17 | 8 | 6 |

Total length of antenna, 0.28 mm.

Described from five females taken by Mr. W. L. McAtee and the writer at Bladensburg, Maryland, September 7 and 20, 1913, from the under surface of leaves of *Sambucus canadensis* L. Larvæ were abundant at the time.

For more than ten years this species has been in my collection, but I have hesitated to describe it because of its evident close relationship to *S. albus* Jones, a Californian species described from specimens taken on *Sambucus* and weeds. The

present insect differs decidedly from *albus,* however, in having a much shorter and more blunt mouth cone, which is not prominently tipped with black. In *albus* this structure is slender and acutely prolonged at the tip, reaching well onto the mesosternum.

**Neurothrips** gen. nov.

Depressed, dull above, glabrous beneath. Head not elongate, decidedly swollen behind eyes, somewhat narrowed at base, cheeks with prominent, bristle-bearing tubercles; vertex with a deep vertical groove, anterior ocellus directed forward; eyes large, closely facetted. Fore femora enlarged in both sexes, often with a large subapical tooth as in *Acanthothrips;* fore tarsi strongly armed in both sexes. Wings of both pairs broad in basal fourth, apical three-fourths abruptly and decidedly narrowed, with sides parallel; median vein prominent in both fore and hind wings, extending nearly to tip. Abdomen with a narrow, but deep, longitudinal dorsal furrow for the reception of the wings. Terminal bristles longer than tube.

Genotype: *Acanthothrips magnafemoralis* Hinds.

Though related to *Acanthothrips,* this genus is abundantly distinguished by the character of the wings, and the presence of an abdominal groove for their reception. Two species, one of which is undescribed, are known to the writer.

The species of this genus are remarkable for the coloration of their dorsal surface—a pleasing combination of bright red, black, and snow-white into a sequence of spots so intricate and involved as to defy description. The appendages and the tip of the abdomen are ringed with black and pale yellow. They are prowlers, living on the trunks and branches of trees, where their coloration blends them well into their environment and makes them difficult indeed to detect.

**Elaphrothrips parallelus** sp. nov.

♀ (macropterous).—Length about 3.4 mm. Color dark blackish brown or black, darkest in last three or four abdominal segments; trochanters, both ends of fore tibiæ, and fore tarsi, somewhat paler; segment 2 of antennæ yellowish in apical half, except inner surface which is concolorous with basal part of segment; segment 3 yellow, infuscate at extreme apex; 4 yellow in basal two-thirds; 5 yellow in basal two-fifths; remainder of antennæ blackish brown; wings of both pairs entirely colorless.

Head about 2.8 times as long as greatest width, narrowest just behind eyes, widest at basal third, and with a short, collar-like widening at extreme base, just behind a distinct constriction; vertex conical, produced, apex attaining base of antennæ but not surpassing the frontal costa, which is distinctly notched between antennæ; dorsal and lateral surfaces finely striate, sparsely set with short, subequal, inconspicuous bristles; inter-ocellar bristles long, but shorter than postoculars, both pairs pointed. Eyes somewhat more than one-sixth as long as head, distinctly flattened at sides, distance across them less than greatest width of head. Ocelli small; anterior ocellus occupying extreme vertex; posterior ocelli distinctly in advance of center of eyes. Antennæ slender, eight-segmented, about 1.25 times as long as head, of the usual form and structure, except that segments 5 and 6 are obliquely truncate at apex; segments 3-5 clavate; 6 and 7 pedicellate; 8 lanceolate, pedicellate, shorter and stouter than usual, less than three times as long as greatest width. Mouth cone short, broadly rounded, reaching somewhat beyond middle of prosternum.

Prothorax about one-third as long as head and (inclusive of coxæ) about 2.3 times as wide as long, median thickening distinct, surface with a few faint lines of sculpture; usual bristles all present, the outer pair at posterior angles much the longest but distinctly shorter than postoculars, others subequal to coxal. Pterothorax subrectangular, longer than wide, slightly narrower than prothorax across coxæ. Wings clear and colorless, of nearly equal width throughout, fore pair with about 20 accessory hairs on posterior margin near apex. Legs slender; fore tarsi with a short, acute, hooked tooth whose point is directed forward on a line parallel to the tarsus.

Abdomen slender, very little wider than pterothorax. Tube markedly short and stout, only 0.56 as long as head and only three times as long as basal width, less than half as wide at apex as at base, sides slightly convex, free from any noticeable bristles. Abdominal bristles pale yellowish, those on segment 9 surpassing tip of tube; terminal bristles five-sixths the length of tube.

Measurements of holotype: Length 3.38 mm.; head, length 0.690 mm., greatest width 0.246 mm., width across eyes 0.236 mm., width just back of eyes 0.207 mm.; eyes, length 0.123 mm., width 0.065 mm., interval 0.105 mm.; prothorax, length 0.198 mm., width (inclusive of coxæ) 0.461 mm.; pterothorax, length about 0.510 mm., width 0.458 mm.; abdomen, greatest width 0.534 mm.; tube, length 0.390 mm., width of base 0.131 mm., at apex 0.062 mm.

| Antennal segments | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Width (microns).. | 51 | 42 | 36 | 39 | 36 | 33 | 30 | 22 |
| Length (microns).. | 60 | 84 | 210 | 169 | 141 | 99 | 69 | 64 |

Total length of antenna, 0.86 mm.*

Described from one female taken by Dr. Alex Wetmore of the United States Biological Survey at Punta Gorda, Florida, February 3, 1919, in miscellaneous sweepings.

Readily separable from the North American species of the genus by the long head, the notched frontal costa, and the short, stout tube. The subequal width of prothorax, pterothorax, and abdomen makes the species readily recognizable to the naked eye.

## Notes on Dragonflies (Odonata) from Lee County, Georgia, with a Description of Enallagma dubium, new species.

By FRANCIS METCALF ROOT, Department of Medical Zoology, School of Hygiene and Public Health, the Johns Hopkins University, Baltimore, Maryland.

During the summer of 1923, while working under Dr. S. T. Darling at the malaria research station maintained by the International Health Board at Leesburg, Georgia, I collected a number of specimens of Odonata in spare moments. This collection contains enough interesting material to be worthy of record, although in the Anisoptera, especially, only a small fraction of the entire fauna is represented.

Lee County is in the southwestern part of the state of Georgia, approximately one hundred miles from the Gulf Coast and one hundred and fifty miles from the Atlantic Coast. Despite this inland location, the Odonate fauna includes several species which, farther north at least, are usually considered sea-coast forms. *Ischnura ramburii,* for example, here replaces *I. verticalis,* and *Libellula auripennis* and *Celithemis ornata* are frequent. The same thing is evident in the mosquito fauna.

*The length of the antenna as given here is appreciably less than the total to be gotten by adding together the measurements given for the individual segments, because of the oblique truncation of the subapical segments.

In spring and fall, if not also in summer, *Anophcles crucians* is the commonest Anopheline of the county. This species, farther north, is usually a salt-marsh breeder.

Surface water is very abundant in Lee County. The underlying formation is limestone, and both deep and shallow "lime sinks," all holding more or less water, are a conspicuous feature of the topography. Appearing and disappearing streams, which bubble up as springs from some lime sink, flow rapidly for distances varying from a few feet to several miles, and then sometimes vanish below the surface again, are common. Two large creeks, the Kinchafoonee and the Muckalee, flow through the county and have various small "branches" as tributaries. Collections of standing water, collectively known as "ponds" to the inhabitants, are also abundant. This designation includes a great variety of water collections, such as large permanent ponds full of water-lilies and lotus, permanent cypress and gum swamps, semi-permanent wooded ponds and swamps which dry out almost or quite completely in the dryest weather, cat-tail swamps formed by obstructions in small streams or old ditch systems, and a great variety of rain-ponds of all sizes, both in woods and in open fields, which are filled with water in spring and early summer, but are usually dry in late summer. Nearly every plantation includes several ponds of one sort or another, and some owners declare that more than half of their places is under water most of the summer.

The species of Odonata taken during my stay in Leesburg (June 20 to Sept. 15) are listed below. My thanks are due to Dr. P. P. Calvert and Dr. E. M. Walker for generous assistance in identifying some of the more difficult specimens.

As a note of interest to collectors, I might add that my only specimens of several species of high- and swift-flying Anisoptera were caught by hand after they had been more or less stunned by flying into the Ford car in which we visited the outlying plantations.

AGRION MACULATUM Beauvais—Fairly common all summer along small streams.

LESTES FORCIPATUS Rambur—Common all summer, especially about the semi-permanent wooded ponds.

LESTES RECTANGULARIS Say—Three males, Hodge's plantation, Aug. 3.

LESTES VIGILAX Hagen—Common about large ponds, July 25-Sept. 4.

ARGIA APICALIS Say—Common along bank of Kinchafoonee Creek near Newsome's plantation, July 12.

ARGIA BIPUNCTULATA Hagen—Two males, Smith's plantation, Sept. 5.

ARGIA FUMIPENNIS Burmeister—Common along small streams and ditches during entire summer.

ARGIA MOESTA PUTRIDA Hagen—Common all summer along Kinchafoonee Creek near Leesburg.

ARGIA SEDULA Hagen—Common along bank of Kinchafoonee Creek near Newsome's plantation, July 12.

ARGIA TIBIALIS Rambur—Taken along small rapid streams. Two males, Stock's plantation, July 6; two males, Bagley's plantation, July 25.

ENALLAGMA DOUBLEDAYI Selys—One of the commonest damselflies of the region. Found throughout the summer in large numbers at nearly all permanent and semi-permanent ponds and swamps.

ENALLAGMA DUBIUM new species—One male from a small lily-pond enclosed by cypress, Scrutchen's plantation, Aug. 24.

ENALLAGMA GEMINATUM Kellicott—Not very common, found mostly at small lily-ponds. One male, Smith's plantation, July 13; one male, Pruitt's plantation, July 26; two males, Scrutchen's plantation, Aug. 24.

ENALLAGMA SIGNATUM Hagen—Common at a single semi-permanent pond on Smith's plantation, Aug. 14.

TELAGRION DAECKII Calvert—One male, June 29; one male, July 10; both in cypress swamps.

NEHALENNIA INTEGRICOLLIS Calvert—Three pairs in copula taken and many others seen along the edges of a cypress swamp on Price's plantation, Aug. 22.

ISCHNURA POSITA Hagen—Two males from small stream near Starkville, June 21.

ISCHNURA PROGNATA Hagen—One male, July 10; one male, Aug. 3; both in cypress swamps.

ISCHNURA RAMBURII Selys—Not uncommon about the larger ponds during the entire summer.

ANOMALAGRION HASTATUM Say—The commonest and most widely distributed damselfly of the region. Found about all kinds of ponds, swamps, ditches, etc., throughout the summer.

GOMPHUS sp?—Two males of a large yellow *Gomphus* which

Dr. Calvert pronounced to be near *G. plagiatus*, but probably distinct, were taken in a brushy pasture on Smith's plantation, Sept. 3.

ANAX JUNIUS Drury—Fairly common all summer about the larger ponds.

ANAX LONGIPES Hagen—One male taken at a large pond on Walker Paul's plantation, July 3.

CORYPHAESCHNA INGENS Rambur—One female caught in Ford car, July 10.

MACROMIA TAENIOLATA Rambur—Seen often, throughout the summer, flying along the roads near Muckalee Creek. One female, Aug. 15 and one male, Sept. 1, both caught after flying into Ford car in this region.

EPICORDULIA PRINCEPS Hagen—Not rare about the larger ponds.

SOMATOCHLORA LINEARIS Hagen—One male caught along edge of a strip of woodland fringing a cypress swamp near Folltown, July 12.

SOMATOCHLORA PROVOCANS Calvert—One female, July 7, caught when it flew into Ford car. According to Dr. Walker, this is the first female of this species to be recorded.

SOMATOCHLORA sp?, near TENEBROSA Say—One female, July 6, caught when it flew into Ford car. The foregoing three specimens of *Somatochlora* were kindly determined for me by Dr. E. M. Walker.

LIBELLULA AURIPENNIS Burmeister—Not uncommon about the larger ponds.

LIBELLULA AXILLENA Westwood—Common, especially about wooded ponds.

LIBELLULA CYANEA Fabricius—One male, Smith's plantation, July 7.

LIBELLULA INCESTA Hagen—Common, especially about wooded ponds.

LIBELLULA PULCHELLA Drury—This species, so common farther north, was not seen at all until one female was taken near Leesburg on July 26. Later several other specimens were seen at the same pond, but the species never became common.

LIBELLULA SEMIFASCIATA Burmeister—One female, Smith's plantation, July 7.

LIBELLULA VIBRANS Fabricius—Common, especially about wooded ponds.

PLATHEMIS LYDIA Drury—Common all summer about small sunny ponds.

PERITHEMIS DOMITIA Drury—Common all summer about the larger ponds.

ERYTHRODIPLAX MINUSCULA Rambur—Common all summer about semi-permanent ponds.

ERYTHEMIS SIMPLICICOLLIS Say—Common all summer about ponds.

SYMPETRUM AMBIGUUM Rambur—Two males, Heath's plantation, July 6.

PACHYDIPLAX LONGIPENNIS Burmeister—The commonest dragonfly of the region. Especially numerous about wooded ponds.

CELITHEMIS ELISA Hagen—Teneral specimens very numerous about several ponds on Walker Paul's plantation, July 12.

CELITHEMIS EPONINA Drury—Not uncommon about certain large ponds on Smith's plantation at all visits.

CELITHEMIS ORNATA Rambur—Although this species was common, the only specimens brought back were some taken at a large grassy pond on Usry's plantation on Aug. 6. Two of these specimens are typical *ornata*. In the other two the markings at the base of the hind wing are considerably reduced, in one only a narrow black band being left. The wings of this particular specimen really look more like a *Leucorhinia* than a *Celithemis*. Since the fourth specimen is more or less intermediate between this condition and the typical *ornata*, it seems best to record them all under that species. A more extensive series would be required to decide whether these two aberrant specimens are extreme variants of *ornata* or something new.

PANTALA FLAVESCENS Fabricius—Common, but flies high and is hard to catch. Specimens taken July 18, Aug. 6, Aug. 10, Sept. 3.

PANTALA HYMENEA Say—Occurs with the preceding species, but not quite so commonly. Specimens taken, July 2, July 18.

TRAMEA CAROLINA Linne—Common, but flies high, as a rule. Specimens taken, June 29, July 12, July 23, July 26, Sept. 1.

**Enallagma dubium,** new species.

On Aug. 24, while collecting at a small lily-pond completely surrounded by cypress swamp, just across the road from the plantation house at Scrutchen's, I saw a small red-and-black damselfly resting on a lily-pad beside a male of *E. geminatum*. A sweep of the net captured the male *geminatum*, but not the other damselfly. A few minutes later the same individual, in all probability, was accidentally caught, without being seen, while I was striking at another *geminatum*,

As soon as it was removed from the net, this damselfly attracted my attention because of the brilliant, metallic, coppery-red color of its pale markings. In alcohol, this has since faded to an orange-yellow. It is a male *Enallagma,* and the appendages show that it belongs in the same group with *signatum, vesperum* and allied forms. Its closest allies would seem to be *pictum* Morse and *concisum* Williamson, with which it shares the peculiarity of having the entire dorsum of the abdomen black, except for very narrow intersegmental rings. The outline of the superior appendages in profile view, superficially at least, resembles that of *signatum* more than it resembles either *pictum* or *concisum.* The color pattern is of the same general type as that of *pictum* and *concisum,* as given in the descriptions of Calvert and of Williamson, but the pale markings are rather more restricted. The pale band of the anterior surface of the frons is less extensive, the two basal joints of the antennae are black, there are no pale spots about the ocelli, the middle lobe of the prothorax is all black dorsally, the pale antehumeral stripe of the thorax is narrower than in the other species, and the dorsal black of the tenth abdominal segment extends farther down the sides than is indicated in the drawings of the other species.

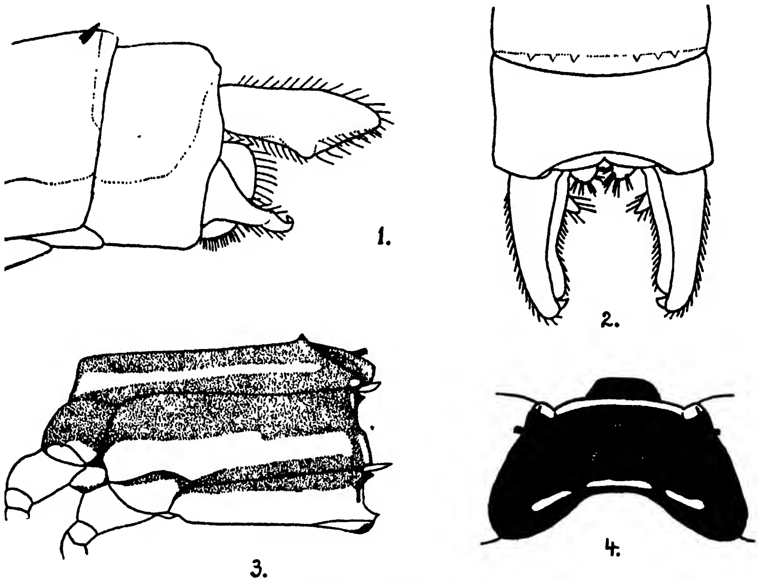
In view of these differences, it seems best to describe this specimen as a new species. I propose for it the name of *E. dubium,* in recognition both of the doubtful advisability of basing a new species on a single specimen and of the possibility that further study may indicate that *pictum, concisum* and *dubium* are all varieties of a single species.

Dr. Calvert has examined the specimen and believes it to be distinct from both *pictum* and *concisum.* I have requested him to deposit the single male type in the collection of the Philadelphia Academy of Natural Sciences.

♂. (Text figs. 1-4) Superior appendages in profile view with the apical margin only slightly shorter than the inferior margin, oblique, nearly straight, and not bilobed, but with the inferior apical angle slightly projecting; in dorsal view the intero-inferior lamella reaches the level, or nearly to the level, of the supero-internal, sub-apical hook. Nasus black. Frons:

pale color of the anterior surface reaching the level of and including the semi-detached sclerites which bear the antennae. Two basal joints of antennae black. No pale markings about ocelli. Pale postocular spots linear cuneiform, broadly separated by black from the pale color of the rear of the head below and narrowly separated from the pale line of the vertex.

Prothorax mainly black dorsally; a transverse orange bar anteriorly on anterior lobe, small indistinct orange spots laterally on posterior lobe, middle lobe without pale markings except for



Figures 1-4.—*Enallagma dubium* n. sp.
Figures 1 and 2.—Male appendages in lateral and dorsal views.
Figure 3.—Color pattern of thorax in lateral view.
Figure 4.—Color pattern of head in dorsal view.

the sides, which are yellow inferiorly. Width of black mid-dorsal thoracic stripe .62 mm., of pale antehumeral .1 mm. through most of its length, widening abruptly to about .2 mm. at anterior end, of black humeral about .49 mm. Second lateral thoracic suture with a black stripe its entire length, gradually widening posteriorly and with slight dorsal and ventral prolongations along the posterior margin.

Abdomen all black dorsally, except for narrow apical (1, 7-9) or basal (3-7) segmental orange rings. Sides and venter of abdomen orange to yellowish, with an indistinct mid-ventral dark stripe.

Wings hyaline, pterostigma light brown, border darker, surmounting less than one cell. Arculus slightly distad to second antecubital, limbs of arculus sub-equal. Upper side of quadrilateral about one third of lower side in front wing, one half of lower side in hind wing. Inferior sector of triangle arises in front of submedian crossvein (at a distance greater than the length of the crossvein) and ends at about the level of origin of the nodal sector. The superior sector of triangle ends between levels of origin of nodal and ultra-nodal sectors. Submedian crossvein between first and second antecubitals, slightly nearer to second. Fore wings with about eight postcubitals, hind wings with about seven. Nodal sector arises nearest fourth postcubital in both hind wings and one fore wing, nearest fifth in other fore wing. Ultra-nodal sector arises one cell proximal to inner brace vein of pterostigma in fore wings, and slightly distal to inner brace vein in hind wings. Three antenodal cells in both wings. Dimensions: Abdomen 20 mm., hind wing 12 mm.

## On the Biology of Curicta drakei Hungerford (Heteroptera, Nepidae).*

By Grace Olive Wiley, St. Paul, Minnesota.

(Plate X.)

The summer of 1922 was spent by the writer in Colorado County, Texas, where insects were collected, principally. Here were obtained a number of specimens of *Curicta drakei*, of the family Nepidae, a species only recently described by Dr. H. B. Hungerford. A sharp lookout had been kept for specimens belonging to this particular genus, since it was known that a specimen of *Curicta howardi* Montandon had been found at Victoria, Texas, about sixty miles distant.

Late in June two nymphs were found clinging to vegetation, along the bank of a large creek where the water was deep. A few days later this place was again visited and a thorough search made in the same pool, which proved fruitless. Skull creek was a good-sized stream, but during the summer the water was only running in places and was reduced to pools, some quite long and deep while others were small and shallow. It

*Contribution from the Department of Entomology, University of Minnesota.

was in one of these shallow pools nearby, that a number of nymphs in various instars and one adult were found. All of these specimens were placed in a container and taken home alive. The following morning there were a few adults, the last instar nymphs having changed during the night. This afforded an excellent opportunity to get the life history of these interesting and little-known bugs. Accordingly several pairs were isolated and in a few days mating was observed. Twelve days after the first mating, eggs were laid, which hatched after another twelve days had expired. At Dr. Hungerford's suggestion, drawings of the egg and the first instar nymph were made, which, along with some notes on their behavior, were sent in for publication.

Leaving for Kansas in the middle of September, the nymphs and adults, numbering more than one hundred, were placed in a light wooden box in their various containers, and carried on this trip. Along with *Curicta* were taken some live specimens of *Velia,* Naucorids, Belostomatids, Gelastocorids, a Coreid and a cockroach. Small glass containers were used, with gauze tied over the tops. Sand and a few pieces of water plants were placed in the bottom of the containers containing the aquatics, and these made rather wet. Occasional observations were made during the trip to make sure the insects were not too dry, and a little water was added from time to time. A supply of live food was taken, which consisted of small snout beetles obtained in large numbers from swamp willows. These made excellent food. Very few fatalities resulted from the trip.

A few weeks later the writer left Kansas for St. Paul, Minnesota. Again the Texan insects in their containers were placed in the wooden box with its small rope handles, aand taken to this northern clime. In addition, some interesting Kansan insects were transported, including *Velia, Gerris, Microvelia* and Gelastocorids. These latter insects were collected by Mr. Wm. E. Hoffman and the writer the last of September. Very little had been said about the longevity of water bugs, so for this reason, as well as a desire to study some of their life histories in the laboratory, the bugs were kept alive.

*Curicta* adults were kept over winter, and the following

summer a number of these insects laid eggs from which young were again reared. The adults brought from Texas were kept segregated and have now passed the second winter successfully. Most of these are still alive and appear quite normal. An attempt will be made to rear nymphs from these specimens during the summer of 1924.

In the south there are, in all probability, two generations a year. Only one generation was obtained in the north, however. All of these bugs were found in Skull creek, except one nymph which was found in a pond at a distance of two miles from this creek. Pools of water located a few rods from the main creek abounded with them. These places were ideal breeding places for mosquitoes, but no mosquitoes or their larvae were found where *Curicta* was present. In the rearing work all sorts of insects were used as food, such as grasshoppers, stink-bugs, various species of beetles including blister-beetles, flies, meal-worms, membracids and mosquito larvae. It was quite a problem to procure food for these insects during the winter, as they were kept in a warm room and were more or less active. Many times when the bugs were hungry and no insect food was available, they were fed on small bits of raw beef.

Like *Nepa, Curicta* is a mud-loving bug and in coloration is very similar to the mud where it is found. When the adults were given mud, rotten wood, decayed vegetation and live water plants, the mud was always chosen for the deposition of the eggs. That the eggs are thus deposited out in nature the writer is fully convinced as a thorough search was made in wood, plants, etc., and none found. While in Texas a few eggs were found in one breeding cage, imbedded in very soft decayed water plant, but no mud or other material was available in this case.

### Respiration of Adults.

In the adults the respiratory tube is open for its entire length, both above and below. It is somewhat similar to the ovipositor of some hymenopterous insects, or the maxillae or sucking tube of certain moths, in that the tube is in two separate parts with the inner side grooved. When placed together they form a tube

through which the insect draws air. These two parts can be rubbed against each other, that is, back and forth, therefore being somewhat retractile. This interesting habit was more often observed when the insects were preening themselves. Stroking the respiratory tube on either side with the posterior legs the insect would then rub the two parts of the tube together with a sliding motion, back and forth. The tube was often opened and closed. In the drawing (Pl. X, fig. 6) is shown a ventral aspect of the last segment with the respiratory tube opened. When the two halves of the respiratory tube are separated, each is found to be fringed with hairs for its entire length on both inner and outer edges. (Pl. X, fig. 6.) When the two halves of this tube are fitted together the double row of fringes along the edges meet to form a water-tight tube. In the drawing, the ventral part of the last abdominal segment, lying laterad to the ventral plate, is pulled back to show the interior entirely covered with fine hairs. The genital organs can be seen by lifting the tip of the ventral plate.

### Mating.

Mating occurs almost every day from early spring until late in the summer. While no record was kept as to the length of time they remain paired, it must be for several hours. While mating the female will often take food when it is placed near.

### Oviposition.

In laying the eggs, the female lies with her body close to the mud and deposits the eggs in groups of from five to ten. These are placed close together with only the crown of filaments visible. These filaments vary in number from 12 to 17. The incubation period is 12 or 13 days. The egg becomes pink several days before hatching and the red eye-spots appear. In hatching the egg breaks transversely for about half its circumference on the prominent shoulder, just below the filaments.

### Nymphal Instars.

*First Instar.* Average length 5.38 mm., width across eyes .75 mm., width across wing pads 1.50 mm., and across abdomen 1.55 mm.

The color of the newly hatched is coral or pink, this becoming straw-colored in a short time, and in several hours light brown with darker markings. On hatching the eyes appear dark reddish-brown, as is also the shield-like plate on top of the head, the spurs on the anterior femur and the grooves into which the anterior tibiae fit. One nymph was observed just after its head appeared through the egg shell; this egg was just above the water. As soon as the bug was able to extricate its anterior legs it moved them about, opening and closing the tibiae. Slowly it emerged, lying on its back, its head soon touching the water. The post-natal molt was cast and clung to the respiratory tube as the little bug crawled forth. It tried to free itself from this membrane by pushing it off with its posterior legs. When it had succeeded it turned over and slowly struggled to its unsteady legs. During the process of hatching the white nerves could be seen in the entire body, as well as the pulsation of circulation.

Structural peculiarities: Elongate, oval, somewhat flattened; much stouter in proportion to its size than in the other instars. Prothorax twice as wide as long; wing pads barely discernible. Respiratory tube appears to be a part of the last abdominal segment. No opening on the dorsal side of this tube except at tip. The structure of the respiratory tube differs greatly in the nymph from that of the adult. Average duration of the first instar, 14 days.

*Second Instar.* Average length 7.75 mm.; width across eyes 1. mm.; width across wing pads 2. mm.; width across abdomen, 2. mm. Color: Same as first instar.

Structural peculiarities: More slender in appearance than first instar. Prothorax somewhat longer in proportion than in first instar; wing pads visible, of same width as abdomen. Respiratory tube relatively longer. Average duration of this instar, 22.5 days.

*Third Instar.* Average length 10.50 mm.; width across eyes 1.21 mm.; width across wing pads 2.71 mm.; width of abdomen 2.45 mm. Color: Similar to the first and second instars.

Structural peculiarities: Much as in second instar. Length of prothorax two-thirds the width of base; wing pads wider than abdomen and reaching to the base of the second abdominal segment. Average duration of the third instar, 23.5 days.

*Fourth Instar.* Average length 13.94 mm.; width across eyes

1.50 mm.; width across wing pads 3.61 mm.; width of abdomen 2.98 mm. Color: Similar to the preceding instars.

Structural peculiarities: Much like preceding instars. Prothorax in length equal to three-fourths of width at base; wing pads wider and reaching to the base of the second abdominal segment. Average duration of the fourth instar, 23.5 days.

*Fifth Instar.* Average length 19.82 mm.; width across eyes 1.86 mm.; width across wing pads 5.47 mm.; width across abdomen 3.62 mm.

Color: Much the same as in the other instars, until a few days before becoming an adult, when the head, prothorax, median part of mesothorax and metathorax, last segment of abdomen, respiratory tube and legs as well as connexivum, become dark woody-brown. The wing pads are dark bronze-brown.

Structural peculiarities: Length of prothorax very little less than width at base. Wing pads reaching to center of the third abdominal segment. Average duration of the fifth instar, 46 days.

## Respiration of Nymphs.

On the ventral side of the nymph are two longitudinal troughs, each situated at about half way between the median line and the lateral margin of the abdomen, the troughs fringed on both edges with very fine silky hairs. In each trough the fringes are so placed as to slope toward the caudal end of the insect, the fringe of the outer edge composed of longer hairs and overlapping with the fringe of the inner edge. These troughs extend from the base of the abdomen to its apex, where the two meet and form the respiratory tube. The tube is also trough-like and fringed on its outer edges with long hairs, this fringe formed by a continuation of the long outer fringes of the abdominal troughs. The respiratory tube of the nymph appears to be formed by the last segment of the abdomen, being much shorter in the nymph than the adult. It is not retractile or capable of being rubbed together as in the adult stage. Although a dark line or marking appears on the dorsal median line, the tube does not open on the dorsal surface except at the very tip.

The nymphs, like the adults, spend a part of the time out of the water, lying flat on the ground, hiding under trash and

sticks, or standing with the head down and the abdomen reared high in the air.

Only occasionally do these bugs prey on their fellows. This may happen when no other food is available. Sometimes when hard pressed for food both young and adults have been observed to feed upon the eggs that were found in the water. These eggs were held by the two anterior legs and were turned around and around in a very clever manner, while the sharp beak was inserted in the egg at various places.

In Butler's "Biology of the British Hemiptera," Lefebure is quoted as observing how *Nepa* emits a milky fluid from "a small pair of glands lying between what he calls the appendicular glands and the oesophagus." The writer has observed that *Curicta* emits a similar milky fluid. This fluid appears to ooze from between the sutures on the sides on the head just back of the rostrum.

## Summary.

*Curicta drakei* has five nymphal instars. Duration of the first nymphal instar for eight nymphs, averaged 14 days; the maximum being 18 days and the minimum 12 days. Duration of the second nymphal instar for eight nymphs, averaged 22 days; the maximum being 31 days and the minimum 15 days. Duration of the third nymphal instar for eight nymphs, averaged 22 days the maximum being 28 days and the minimum 11 days. Duration of the fourth nymphal instar for eight nymphs, averaged 23 days; the maximum being 29 days and the minimum 16 days Duration of the fifth nymphal instar for eleven nymphs, averaged 40 days; the maximum being 50 days and the minimum 15 days.

Mr. Wm. E. Hoffmann also reared this species during the summer of 1923, with the same results.

Temperature surely has much to do with the rate of their development. Nymphs reared in Texas to the fourth instar and those reared through the first and second instars in Minnesota, during the warmest weather, developed much more quickly than the older instars reared in cooler weather. One nymph spent only 15 days in the fifth instar, when kept in a warm room. The shortest period of development from the time of hatching to the adult was 93 days, while the longest was 145 days

sticks, or standing with the head down and the abdomen reared high in the air.

Only occasionally do these bugs prey on their fellows. This may happen when no other food is available. Sometimes when hard pressed for food both young and adults have been observed to feed upon the eggs that were found in the water. These eggs were held by the two anterior legs and were turned around and around in a very clever manner, while the sharp beak was inserted in the egg at various places.

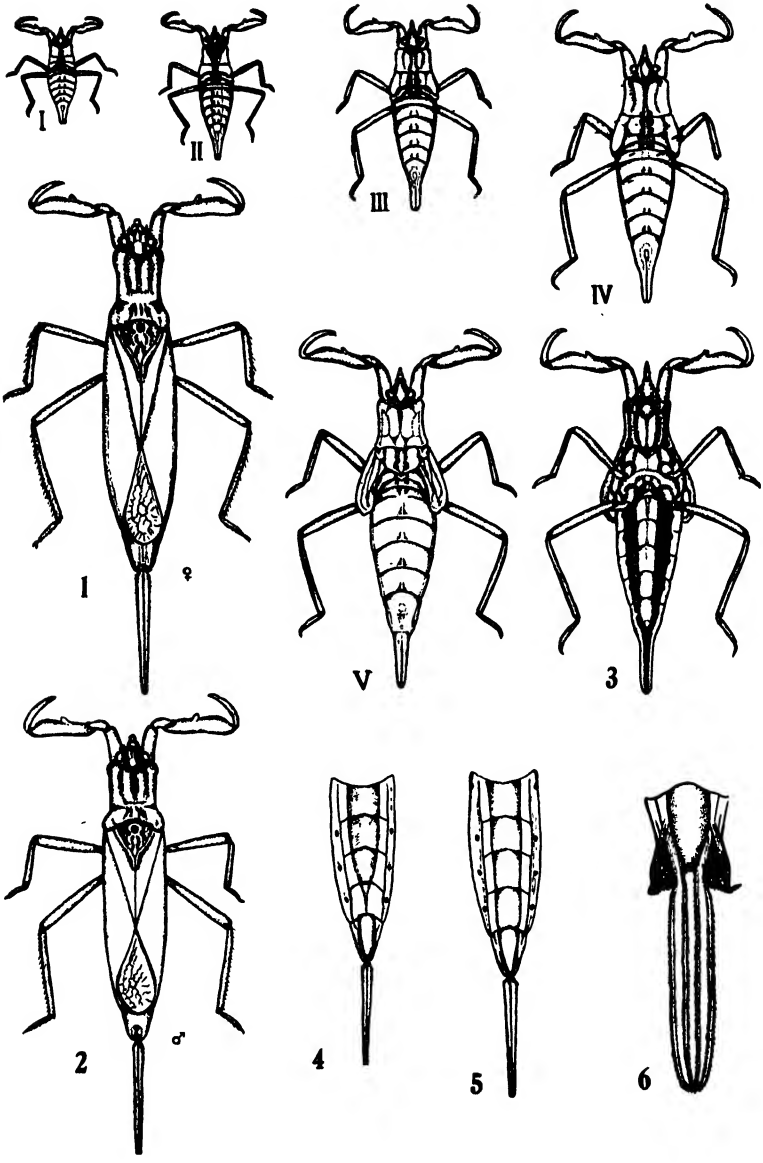
In Butler's "Biology of the British Hemiptera," Lefebure is quoted as observing how *Nepa* emits a milky fluid from "a small pair of glands lying between what he calls the appendicular glands and the oesophagus." The writer has observed that *Curicta* emits a similar milky fluid. This fluid appears to ooze from between the sutures on the sides on the head just back of the rostrum.

## Summary.

*Curicta drakei* has five nymphal instars. Duration of the first nymphal instar for eight nymphs, averaged 14 days; the maximum being 18 days and the minimum 12 days. Duration of the second nymphal instar for eight nymphs, averaged 22 days; the maximum being 31 days and the minimum 15 days. Duration of the third nymphal instar for eight nymphs, averaged 22 days; the maximum being 28 days and the minimum 11 days. Duration of the fourth nymphal instar for eight nymphs, averaged 23 days; the maximum being 29 days and the minimum 16 days. Duration of the fifth nymphal instar for eleven nymphs, averaged 40 days; the maximum being 50 days and the minimum 15 days.

Mr. Wm. E. Hoffmann also reared this species during the summer of 1923, with the same results.

Temperature surely has much to do with the rate of their development. Nymphs reared in Texas to the fourth instar, and those reared through the first and second instars in Minnesota, during the warmest weather, developed much more quickly than the older instars reared in cooler weather. One nymph spent only 15 days in the fifth instar, when kept in a warm room. The shortest period of development from the time of hatching to the adult was 93 days, while the longest was 145 days.




BIOLOGY OF CURICTA DRAKEI.—WILEY.

TABLE OF MEASUREMENTS.

| | | Length. | | Width across eyes. | | Width across wing-pads. | | Width across abdomen. |
|---|---|---|---|---|---|---|---|---|
| First Instar. | ave. | 5.38 mm. | | .75 mm. | | 1.50 mm. | ave. | 1.55 mm. |
| | max. | 5.50 mm. | | | | | max. | 1.66 mm. |
| | min. | 5. | | | | | min. | 1.50 mm. |
| Second Instar. | ave. | 7.75 mm. | | 1. mm. | | 2. mm. | | 2. mm. |
| | max. | 8. mm. | | | | | | |
| | min. | 7.66 mm. | | | | | | |
| Third Instar. | ave. | 10.50 mm. | ave. | 1.21 mm. | ave. | 2.71 mm. | ave. | 2.45 mm. |
| | max. | 11. mm. | max. | 1.25 mm. | max. | 2.75 mm. | max. | 2.50 mm. |
| | min. | 10. mm. | min. | 1.12 mm. | min. | 2.50 mm. | min. | 2.25 mm. |
| Fourth Instar. | ave. | 13.94 mm. | ave. | 1.50 mm. | ave. | 3.61 mm. | ave. | 2.98 mm. |
| | max. | 14.33 mm. | max. | 1.66 mm. | max. | 3.80 mm. | max. | 3.25 mm. |
| | min. | 13.25 mm. | min. | 1.33 mm. | min. | 3.33 mm. | min. | 2.66 mm. |
| Fifth Instar. | ave. | 19.82 mm. | ave. | 1.86 mm. | ave. | 5.47 mm. | ave. | 3.62 mm. |
| | max. | 21.25 mm. | max. | 2. mm. | max. | 6.25 mm. | max. | 4. mm. |
| | min. | 18.. mm. | min. | 1.75 mm. | min. | 5. mm. | min. | 3. mm. |

EXPLANATION OF PLATE X.

1. *Curicta drakei* Hungerford, adult female.
2. Adult male.
3. Ventral aspect, fifth instar nymph.
4. Ventral aspect of male abdomen.
5. Ventral aspect of female abdomen.
6. Ventral aspect of last abdominal segment with respiratory tube opened.

I. First Instar Nymph.
II. Second Instar Nymph.
III. Third Instar Nymph.
IV. Fourth Instar Nymph.
V. Fifth Instar Nymph.

## Aphids with Branched Cornicles (Homop.).*

By EDITH M. PATCH, Orono, Maine.

A collection of six aphids, remarkable as to their cornicle structure, was taken at Freeport, Maine, September 5, 1923, by my field assistant, Miss Edith Merchant. They were taken from dock (*Rumex* sp) and had been mounted for some time before I saw them.

They possess what is, so far as my experience or information goes, a unique structure, in that their cornicles are forked or branched in appearance.

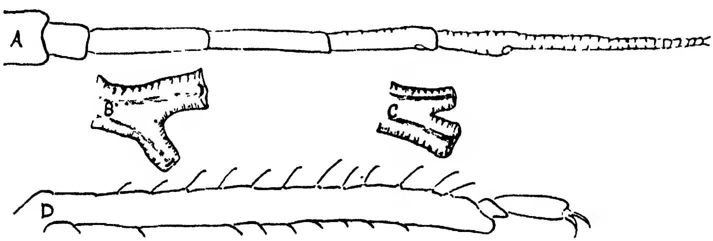
None of the specimens were mature, though one was so near its last molt that the loosened·chitin of this individual reveals

*Papers from the Maine Agricultural Experiment Station: Entomology, No. 113.

the fact that the cornicle of the mature form would be of the same type as that of the nymphs. The nymphs represent two different instars and all twelve cornicles are branched.

My own interpretation of this material was that it represented a strange new species of a strange new genus; and I prepared a description for publication on that basis.

While the paper was still in manuscript, however, I submitted it, together with specimens of the aphid, to a fellow aphidist who called my attention to the possible significance of the fact that each so-called "fork" of the cornicle was equipped with a muscle from the "lid" passing down to its attachment in the body in the manner usual for the single muscle of an ordi-




Figures A, B, and D, antenna, cornicle, and hind tibia of aphid in last nymphal instar. C, cornicle of younger nymph.

nary or "unbranched" cornicle. This raised the question as to whether the cornicle was, structurally considered, "branched" or whether it was "double." In other words, did these aphids really have a supernumerary pair of cornicles? The fact that their outer walls are fused for a certain distance, giving the appearance of a branched structure, does not affect this interpretation.

Except for the cornicles, these six nymphs resemble those of *Aphis abbreviata* closely. It is possible that future collections will solve the problem as to whether the forked (?) or double (?) condition of these cornicles constitutes a specific and generic difference; or whether this condition must be considered in the light of supernumerary organs in general.

Meanwhile a brief note concerning the six aphids which, from either viewpoint, are interesting is perhaps worth recording.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., NOVEMBER, 1924.

## A Unique Resting Place for a Fossil Insect (Odonata).

Under the title "Tarsophlebiopsis mayi n. g. et n. sp., a Dragonfly found in the body-chamber of a Corallian Ammonite" (Geol. Mag., London, lx, 146-52, Pl. IV and 3 text figs., April, 1923), Dr. R. J. Tillyard describes three fragments of a dragon-fly's wings, all embedded in the matrix of the body-chamber of an ammonite, found in the boulder clay of Hertfordshire, England. He says: "All three fragments clearly belong to one and the same insect and must have been washed into the body-chamber of the dead ammonite with the deposit which now forms its hardened matrix. That is to say, the geological age of the dragon-fly is the same as that of the ammonite, though in point of actual time it may be assumed that the ammonite died first, and decomposed and then the dragon-fly died and was washed away, its remains coming to rest within the body-chamber of the dead ammonite while it was being filled up by a muddy deposit."

This fossil is assigned to the family Tarsophlebiidae "confined as far as present knowledge goes to the Upper Jurassic (Malm) of Bavaria. The discovery of the fossil dealt with in this paper constitutes the first record of the family for England; for the Upper Jurassic material recently examined by me from the British Museum does not contain a single representative of this family, or any close relative of it; . . . the fragment of a wing named *Tarsophlebia westwoodi* by Giebel, from the Lower Lias of Cheltenham is not a *Tarsophlebia* at all, but belongs to an entirely distinct family, confined to the Lower Lias, which I intend to call Liassophlebiidae."

## Gaditanus, Being Additional Words on Tingitidae (Heteroptera).

Dr. Holland's remarks on "Tingitidae"[1] bring up again a question of moment to entomologists, since it continues a lengthened discussion of latinity, which it endeavors to settle *ex cathedra,* on the plea that "the laws of priority do not have precedence over the laws of correct language."

The fundamental question to be answered is: Are names in biology convenient and arbitrary tags to designate material things, or are they a field for linguistics?

The great needs in nomenclature are stability and finality

[1]Ann. Ent. Soc. Am. XVII: 95.

which necessarily leads to the former. Biology presents a vast field, the surface of whose edges is barely scratched. Now if we discuss and argue about and reshape the terminology while the field continues untilled, we are certainly wasting precious productive moments in sterile labor.

Why should we vex ourselves with applying the canons of classic latinity to what are at best barbaric neolatinisms? And frequently are only arbitrary pronounceable combinations of letters in latinized form? Synonymy is already cluttered up with "emendations" of one kind or another, emendations the fruit of someone's passion for what amounts to preciosity. Why worry if the proper form is Tingidae, Tingididae or Tingitidae? They all stand for the same thing, and they are so understood by everybody.

Further, if we admit this principle of latinity as a criterion for family names, then it is quite open for anyone to change generic and specific names in *any* way. It has already been done. So conservative a man as Dr. E. Bergroth has changed Kirkaldy's *Anisops edepol* to *A. kirkaldyanus* on the plea that the former is "unansehnlich." If this door be left open, stability, let alone finality, is gone.

A very proper question for the next Zoological Congress would be the final settlement of this question. In fact, the Internationaal Committee on Nomenclature should be now actively discussing it for definite, considered and final action.

J. R. DE LA TORRE BUENO, White Plains, New York.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

1—Proceedings of the Academy of Natural Sciences of Philadelphia. 4—Canadian Entomologist, Guelph, Canada. 5—Psyche, Cambridge, Mass. 6—Journal of the New York Entomological Society. 7—Annals of the Entomological

Society of America, Columbus, Ohio. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **20**—Bulletin de la Societe Entomologique de France, Paris. **22**—Bulletin of Entomological Research, London. **24**—Annales de la Societe Entomologique de France, Paris. **29**—Annual Report of the Entomological Society of Ontario, Toronto, Canada. **31**—Proceedings of the Acadian Entomological Society, Truro, N. S. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **36**—Transactions of the Entomological Society of London. **38**—"Redia," Firenze, Italy. **50**—Proceedings of the United States National Museum. **52**—Zoologischer Anzeiger, Leipzig. **59**—Journal of Agricultural Research, Washington, D. C. **64**—Parasitology, London. **76**—Nature, London. **82**—The Ohio Journal of Science, Columbus. **89**—Zoologische Jahrbucher, Jena. **95**—Annales des Sciences Naturelles, Zoologie, Paris. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **103**—Biologisches Centralblatt, Leipzig. **111**—Archiv fur Naturgeschichte, Berlin. **118**—Die Naturwissenschaften, Berlin. **129**—The Bulletin of the Hill Museum, Witley, Surrey, England. **138**—American Museum Novitates, New York. **141**—Internationale Entomologische Zeitschrift, Guben. **146**—"Konowia," Wien. **147**—Archiv fur Mikroskopische Anatomie und Entwicklungsmechanik, Berlin. **151**—Occasional Papers of the Boston Society of Natural History. **156**—Genetics, New York.

**GENERAL. Berlese, A.**—Un apparecchio per disegnare al microscopio. **38,** xv, 11-16. **Bethune, C. J. S.**—The early days of the entomological society of Ontario. **29,** liv, 11-12. **Blair, K. G.**—Some notes on luminosity in insects. **8,** 1924, 173-78. **Burgess, A. F.**—The value of natural enemies of injurious insects. **29,** liv, 30-6. **Caudell, A. N.**—(See under Orthoptera). **Dodds & Hisaw**—Ecological studies of aquatic insects. II. Size of respiratory organs in relation to environmental conditions. (Ecology, v, 262-71.) **Fladung, E. B.**—Insects as food. (Bull. Maryland Ac. Sci., iv, No. 4, p. 5-8.) **Glaser, R. W.**—Rearing flies for experimental purposes with biological notes. **12,** xvii, 486-96. **Henriksen & Lundbeck**—Landarthropoder (Insecta et Arachnida). **Faunae Groenlandicae.** (Medd. om Groenland, xxii, 484-821,

1918.) **Marshall, J. F.**—An improved form of apparatus for "low power" insect photomicrography. **22,** xv, 49-50. **Oberthur, C.**—Obituary. **8,** 1924, 215-6; **9,** 1924, 191-2. **Poulton, E. B.**—The relation between the larvae of the asilid genus Hyperechia and those of xylocopid bees. **36,** 1924, 121-33. **Provancher**—L'etude des insectes. (Le Naturl. Canadien, li, 57-60.) **Schulz, W. A.**—Ein altes, verschollenes werk uber tiersystematik. **111,** 1912, A, 9, 21-91. **Steineger, L.**—A chapter in the history of zoological nomenclature. (Smiths. Miscel. Coll., lxxvii, No. 1.) **Stichel, W.**—Fur die sammelpraxis. **141,** xviii, 81-2. **Treherne, R. C.**—Obituary. **12,** xvii, 506-8. Obituary (with bibliography). **4,** lvi, 151-3. **Watson, H.**—The application of the law of priority. **11,** xiv, 328-337. **Weiss & West**—Insects and plants of a dry woods in the pine barrens of New Jersey. (Ecology, v, 241-53.) **Williams, C. B.**—An improved light trap for insects. **22,** xv, 57-60.

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC. Arrow, G. J.**—Vocal organs in the coleopterous families Dytiscidae, Erotylidae and Endomychidae. **36,** 1924, 134-43. **Becker, E.**—Zur morphologischen bedeutung der pleuren bei Ateloceraten. **52,** lx, 169-85. **Bertolini, F.**—Ricerche sulla struttura del tegumento delle larve di Pieris brassicae. Considerazioni sulla evoluzione degli organismi. **38,** xv, 69-71; 115-75. **Bischoff, W.**—Die segmentierung der Blepharoceriden-larven und puppen und die okologische begrundung der larven-phylogenie. **52,** lx, 231-51. **Brecher, L.**—Die puppenfarbungen des kohlweisslings, Pieris brassicae. Die puppenfarbungen der Vanessiden (V. io, V. urticae). Die bedingungen fur fuhlerfusse bei Dixippus morosus. **147,** cii, 501-16; 517-48; 549-72. **Calman, W. T.**—Chimaeras dire: Transplantation of heads of insects. **76,** cxiv, 467. **Cavazza, F.**—Studio sperimentale di alcuni casi di determinazione del sesso e di partenogenesi. **38,** xv, 19-68. **China, W. E.**—On the luminosity of Laternaria phosphorea (with bibliography). **36,** 1924, xlix-lii. **Cockayne, E. A.**—The distribution of fluorescent pigment in lepidoptera. **36,** 1924, 1-19. **Gatenby, J. B.**—The scorpion spermateleosis. **76,** cxiv, 380-1. **Gates, R. R.**—Species and chromosomes. **76,** cxiv, 353-56. **de Gryse & Treherne**—The male genital armature of the Thysanoptera. **4,** lvi, 177-82. **Harris, R. G.**—Sex of adult Cecidomyidae (Oligarces sp.) arising from larvae produced by paedogenesis. **5,** xxxi, 148-54. **Hartwell, R. H.**—A study of the olfactory sense of termites. **7,** xvii, 131-62.

**Ito, H.**—Contribution histologique et physiologique a l'etude des annexes des organes genitaux des orthopteres. (Archiv. Anat. Microscop., Paris, xx, 343-460). **Keilin, D.**—Sur la position primitive des stigmates chez les insectes et sur le sort des stigmates thoraciques. **20**, 1924, 125-8. **Krafka, J.**—Development of the compound eye of Drosophila melanogaster and its bar-eyed mutant. **100**, xlvii, 143-8. **Kruger, E.**—Analytische studien zur morphologie der hummeln. **89**, Syst., 1-128. **Michael, H.**—Über den bau der geschlechtsapparate und die kopulation von Bombyx mori. **111**, 1923, A, 12, 25-55. **Payne, F.**—Crossover modifiers in the third chromosome of Drosophila melanogaster. **156**, ix, 327-42. **Pehani, H.**—Die reifung der geschlechtszellen bei Phasmiden. **103**, lxiv, 422-8. **Przibram, H.**—Uber die funktion der kaferfuhler, insbesondere des wasserkafers Hydrophilus piceus. **52**, lx, 251-61. **Przibram, H.**—Chimaeras dire : Transplantation of heads of insects. **76**, cxiv, 347. **Przibram, H.**—Die rolle der dopa in den kolonen gewisser nachtfalter und blattwespen mit bemerkungen uber die chemischen orte der melaninbildung. **147**, cii, 624-34. **Pulikovsky, N.**—Metamorphosis of Deuterophlebia (Diptera, Deuterophlebiidae). **36**, 1924, 45-63. **Puri, I. M.**—Studies on the anatomy of Cimex lectularis. II. **64**, xvi, 269-78. **Roher, A.**—Ueber farbung und sinne der schmetterlinge. **141**, xviii, 98-100. (Cont.). **Sanchez, D.**—L'histolyse dans les centres nerveux des insectes. Action specifique des batonnets retiniens des insectes. (Trav. Lab. Rech. Biol. Univ. Madrid, xxi, 385-422; 143-67). **Seiler, J.**—Die crossing-over studien der schule Morgan. **118**, 1924, 677-85. **Shannon & Bromley.**—Radial venation in the Brachycera. **15**, xii, 137-40. **Snodgrass, R. E.**—Anatomy and metamorphosis of the apple maggot, Rhagoletis pomonella. **59**, xxviii, 1-36. **Stockhert, F. K.**—Uber gynandromorphie bei bienen und die beziehungen zwischen den primaern und sekundaren geschlechtscharakteren der insekten. **111**, 1924, A, 2, 109-31. **Teodoro, G.**—Sulla struttura delle alitre negli emitteri eterotteri. Sopra un particolare organo esistente nelle elitre degli eterotteri. **38**, xv, 79-86; 87-95. **Tzulesco, V. N.**—Contribution a l'etude des Culicides; denticulation des maxilles de Culex pipiens. (An. Sci. Univ. Jassy, xiii, 194-8). **Weber, H.**—Das thorakalskelett der lepidopteren. (Zeit. f. Anat. u. Entwickl., lxxiii, 277-331). **Weiss, H. B.**—The color of bugs. **6**, xxxii, 163. **Wilson, I. T.**—Two new hereditary tumors in Drosophila. **156**, ix, 343-62. **Zavattari, E.**—Ricerche morfologiche ed etologiche sullo psicodide Telmatoscopus meridionalis. **38**, xv, 191-235.

**ARACHNIDA AND MYRIOPODA. Chamberlin, J. C.**—Giant garypus of the Gulf of California. (Nature Mag., 1924, 171). **Gerhardt, U.**—Weiter sexualbiologische untersuchung an spinnen. **111,** 1923, A, 10, 1-225. **Rau, P.**—Some life history notes on the black window spider, Latrodectus mactans. **5,** xxxi, 162-6. **Ribeyro & Bambaren**—El Leptus japa de las montanas del Peru. (Arch. Asoc. Peruana, ii, 113-16).

**Berlese, A.**—Centuria sesta di Acari nuovi. **38,** xv, 237-62. ***Emerton, J. H.**—New spiders from southern New England. **5,** xxxi, 140-5.

**THE SMALLER ORDERS OF INSECTA. Baldus, K.**—Experimentale untersuchungen uber die entfernungslokalisation bei Libellen. **118,** 1924, 725-4. **Fuller, C.**—A question of synonymy. Eutermes and Microcerotermes. (So. African Jour. N. H. iv, 277-80). **Snyder, T. E.**—"Adaptions" to social life: the termites (Isoptera). (Smiths. Miscel. Coll., lxxvi, No. 12). **Wickware, A. R.**—Notes on lice with special reference to the chicken louse, Lipeurus heterographus. **29,** liv, 67-71.

**Herrick, G. W.**—The genus Limothrips in America. **7,** xvii, 231-2. **Lestage, J. A.**—Notes sur les Ephemeres de la monographical revision de Eaton. **33,** 1924, 33-60. ***Martynov, A. V.**—Preliminary revision of the family Phryganeidae, its classification and evolution. **11,** xiv, 209-24. **Walker, E. M.**—The Odonata of the Thunder Bay district, Ontario. **4,** lvi, 170-6. (Cont.).

**ORTHOPTERA.**

**Blatchley, W. S.**—Notes on the O. of the eastern U. S. **6,** xxxii, 127-32. **Campos, F.**—Contribucion al conocimiento de los Orthopteros. (Riv. Col. Vic. Rocafuerte, v, No. 11-12). **Caudell, A. N.**—Some insects from the Chilibrillo bat caves of Panama. **15,** xii, 133-6. ***Caudell, A. N.**—Notes on Grylloblatta with description of a new sp. (Jour. Wash. Acad. Sci., xiv, 369-73). **Chopard, L.**—Description d'un Blattide myrmecophile nouveau. **20,** 1924, 131-2. **Hebard, M.**—Studies in the Dermaptera and Orthoptera of Ecuador. **1,** lxxvi, 109-248. **Vignon, P.**—Les au sauterelles-feuilles de l'Amerique tropicale. (La Nature, Paris, 1924, 102-5).

**HEMIPTERA. Barber, G. W.**—Doratura stylata in Massachusetts. **5,** xxxi, 170. **DeLong, D. M.**—Some observa-

tions on the life cycle and habits of Dorydiella floridana. (Cicadellidae). **82,** xxiv, 195-8. **Teodoro, G.**—Coccidologica. **38,** xv, 177-9.

***Barber, H. G.**—Corrections and comments. (Heteroptera). **6,** xxxii, 133-7. ***Beamer, R. H.**—A new variety of Cicada. **4,** lvi, 200-2. **Fracker & Bruner.**—Notes on some Neotropical Reduviidae. **7,** xvii, 163-74. **Hamlin, J. C.**—A review of the genus Chelinidea with biological data. **7,** xvii, 193-208. ***Hartzell, A.**—The genus Empoasca in No. America. (Proc. Iowa Ac. Sci., xxx, 87-134). ***Hungerford, H. B.**—Stridulation of Buenoa limnocastoris, and systematic notes on the Buenoa of the Douglas Lake region of Michigan, with the description of a new form. (Notonectidae). **7,** xvii, 223-7. ***McAtee, W. L.**—Notes on Cenchrea and Cedusa in America. (Fulgoroidea). **7,** xvii, 175-87. **Muir, F.**—An American Tettigometrid. **7,** xvii, 219-22. ***Robinson, W.**—Additional n. sps. of Erythroneura (Cicadellidae). **4,** lvi, 154-7.

**LEPIDOPTERA. Bowman, K.**—Annotated check list of the macrolepidoptera of Alberta. Additions. **4,** lvi, 189-91. **Dow, R. P.**—Migration of Pyrameis cardui. **6,** xxxii, 121. **Hutchings, C. B.**—A study of the pupal case of Prionoxystus macmurtrei. **29,** liv, 63-8. **Meisenheimer, J.**—Die vererbung von art-und geschlechtsmerkmalen bei Biston-artkreuzungen. **89,** xli, Allg. Zool., 1-90.

**D'Almeida, R. F.**—Les Papilionides de Rio de Janeiro: Description de deux chez chenilles. **24,** xciii, 23-30. **Bouvier, E. L.**—Contribution a l'etude des Saturniens. **95,** vii, 137-78. **Dalla Torre, K. W.**—Lepidopterorum catalogus. Pars 30: Epiplemidae, Uraniidae. **Forbes, W. T. M.**—The genus Mechanitis (Ithomiinae). **6,** xxxii, 146-58. **Forbes, W. T. M.**—The family position of Graphelysia. **5,** xxxi, 146-7. **Joicey & Talbot**—Three new South American butterflies. **129,** i, 570-1. **Kruger, E.**—Die Morphiden Kolumbiens nebst einigen allgemeinen bemerkungen uber Morphiden. (Deut. Ent. Zeit. "Iris," xxxviii, 23-39 (cont.)). **Lathy, P. I.**—The iridescent species of Euselasia. **11,** xiv, 283-85. **May, E.**—Morpho absoloni sp. nov. (Bol. Mus. Nac., R. d. Janeiro, i, 217-18). **Tams, W. H. T.**—Notes on some species of the genus Cosmophila. **36,** 1924, 20-4.

**DIPTERA. Bodenheimer, F.**—Beitrage zur kenntnis von Tipula oleracea. Zur kenntnis der larve. **89,** Syst., 129-54.

**Curran, C. H.**—Taxonomic and synonymic tendencies with especial reference to diptera. **29,** liv, 20-24.

**Aldrich, J. M.**—Notes on some types of American Muscoid diptera in the collection of the Vienna Nat. Hist. Museum. **7,** xvii, 209-18. ***Alexander, C. P.**—New or little known crane-flies from New England. **151,** v, 115-8. **Borgmeier, T.**—Novos generos e especies de Phorideos do Brasil. (Bol. Mus. Nac. R. d. Janeiro, i, 167-202). ***Bromley, S. W.**—New robber-flies. (Asilidae). **151,** v, 125-7. ***Brues, C. T.**—New and unrecorded American sps. of the family Phoridae. **5,** xxxi, 155-61. ***Cockerell, T. D. A.**—An ancestor of the Agromyzidae. **9,** 1924, 199-201. ***Curran, C. H.**—New Canadian D., with synopsis of the genus Cynorhina. **4,** lvi, 193-6. **Curran, C. H.**—Concerning the availability of certain taxonomic characters and their significance. **5,** xxxi, 167-9. **Curran, C. H.**—Rhagoletis pomonella and two allied species. **29,** liv, 56-7. **Duda, O.**—Revision der europaischen u. gronlandischen sowie einiger sudostasiat. arten der gattung. Piophila. **146,** iii, 97-113 (cont.). ***Dyar, H. G.**—A note on Sabethes. Notes on some Sabethids from Central America. Notes on the Sabethids of the West Indies. Phoniomyia and Dendromyia. A note on Wyeomyia. Note on the American Aedes of the scapularis-group. Some new mosquitoes from Colombia. Two new mosquitoes from California. Mosquitoes from Chile. The larva of Aedes alleni. The larva of Aedes thelcter. The larva of Culiseta maccrackenae. **15,** xii, 97-100; 101-104; 104-107; 107-113; 113-117; 117-119; 119-124; 125-127; 128-131; 131-132; 132; 144. ***Ewing, H. E.**—Notes on the taxonomy and natural relationships of fleas, with descriptions of four n. sps. **64,** xvi, 341-54. **Linder, E.**—Eine neue Chiromyzide, Clavimyia alticola. **52,** lx, 160-1. **Lindner, E.**—Rhagionidae neotropicae. **146,** iii, 65-75. ***Malloch, J. R.**—Three new sps. of Agromyza and synonymical notes. **4,** lvi, 191-2. **Matheson, R.**—The genera of Culicidae of North Am. **4,** lvi, 157-61. ***Shannon, R. C.**—A new Cynorhinella (Syrphidae). **151,** v, 123-4. ***Spuler, A.**—North Am. sps. of the subgenera Opacifrons and Pteremis of the genus Leptocera (Borboridae). **5,** xxxi, 121-35. ***Tothill, J. D.**—A revision of the Nearctic sps. of the genus Gonia. (Tachinidae). **4,** lvi, 196-200.

**COLEOPTERA. Achard, J.**—Essai d'une subdivision nouvelle de la famille des Scaphidiidae. **33,** 1924, 25-31. **Cutright, C. R.**—Bionomics of Hippodamia tredecim-punctata. **7,** xvii, 188-92. **Dury, C.**—Notes on Cychrus and the sad

misfortunes of an entomologist. **6,** xxxii, 122-3. **Gorham, R. P.**—Notes on Agriotes mancus, at Dartmouth, N. S. **31,** No. 9, 69-72. **Knaus, W.**—1923 collection and life history notes on Strategus mormon. A color form of Cicindela repanda-unijuncta. **6,** xxxii, 124-5; 126. **Ochs, G.**—On the West Indian Gyrinidae and a n. sp. of Gyretes from northern Brazil. **138,** No. 125. **Parker & Boving**—The blister beetle, Tricrania sanguinipennis—biology, descriptions of different stages, and systematic relationship. **50,** lxiv, Art. 23. **Weiss, H. B.**—Galls on Apion hibisci. **6,** xxxii, 126.

***Blatchley, W. S.**—New C. from southern Florida, with notes on other interesting species. **4,** lvi, 164-70. **Bryant, G. E.**—New species of Phytophaga. **11,** xiv, 247-52. **Chittenden, F. H.**—The amaranth curculio, Conotrachelus seniculus. **6,** xxxii, 119-21. **Desbordes, H.**—Description de deux Histerides nouveaux. Description d'un Lioderma nouveau de l'Amerique du Sud. **20,** 1924, 115-7; 122-3. **Obenberger, J.**—Kritische studien uber die Buperstiden. **111,** 1924, A, 3, 1-171. ***Schaeffer, C.**—On a few new and old Chrysomelidae. **6,** xxxii, 138-45.

**HYMENOPTERA. Smulyan, M. T.**—Attacks of Vespa communis on Hyphantria cunea. **5,** xxxi, 138-9. **Viehmeyer, H.**—Polymorphismus und ernahrung bei den ameisen. **111,** 1923, A, 12, 1-12.

**Compere, H.**—A preliminary report on the parasitic enemies of the citricola scale (Coccus pseudomagnoliarum) with descriptions of two new chalcicoid parasites. (Bul. So. Cal. Ac. Sci., xxiii, 111-23). ***Fenton, F. A.**—New parasitic H. of the subfamily Anteoninae (Bethylidae). **82,** xxiv, 191-4. **Ferriere, Ch.**—Note sur deux nouveaux Chalcidiens Phytophages du Paraguay. **24,** xciii, 1-21. ***Sandhouse, G. A.**—New North Am. species of bees belonging to the genus Halictus (Chloralictus). **50,** lxv, Art. 19. ***Viereck, H. L.**—A remarkable ichneumonine. **4,** lvi, 202. **Wheeler, W. M.**—A gynandromorph of Tetramorium guineense. **5,** xxxi, 136-7.

## SPECIAL NOTICES.

**Juan Fernandez and Easter Island,** The Natural History of. Vol. III, Zoology, Part 3, contains articles on: Ichneumonidae and Vespidae by Roman; Odonata and Orthoptera by Sjostedt; Coleoptera by Zimmermann, Weise, Fleutiaux, Lesne, Pic; Neuroptera by Esben-Petersen; Parasitic Hym.

by Brues; Formicidae by Wheeler; Gryllides by Chopard; Thysanura by Silvestri; Ternites by Emerson; Hemiptera by Bergroth; Myriapoda and Arachnida by Verhoeff and Berland.

MANUAL OF TREE AND SHRUB INSECTS. A General Account of the More Important or Common Insects Attacking Shade and Forest Trees and Shrubs and Woody Ornamentals. By EPHRAIM PORTER FELT, State Entomologist of New York. The Macmillan Company, New York, 1924, pp. 382.

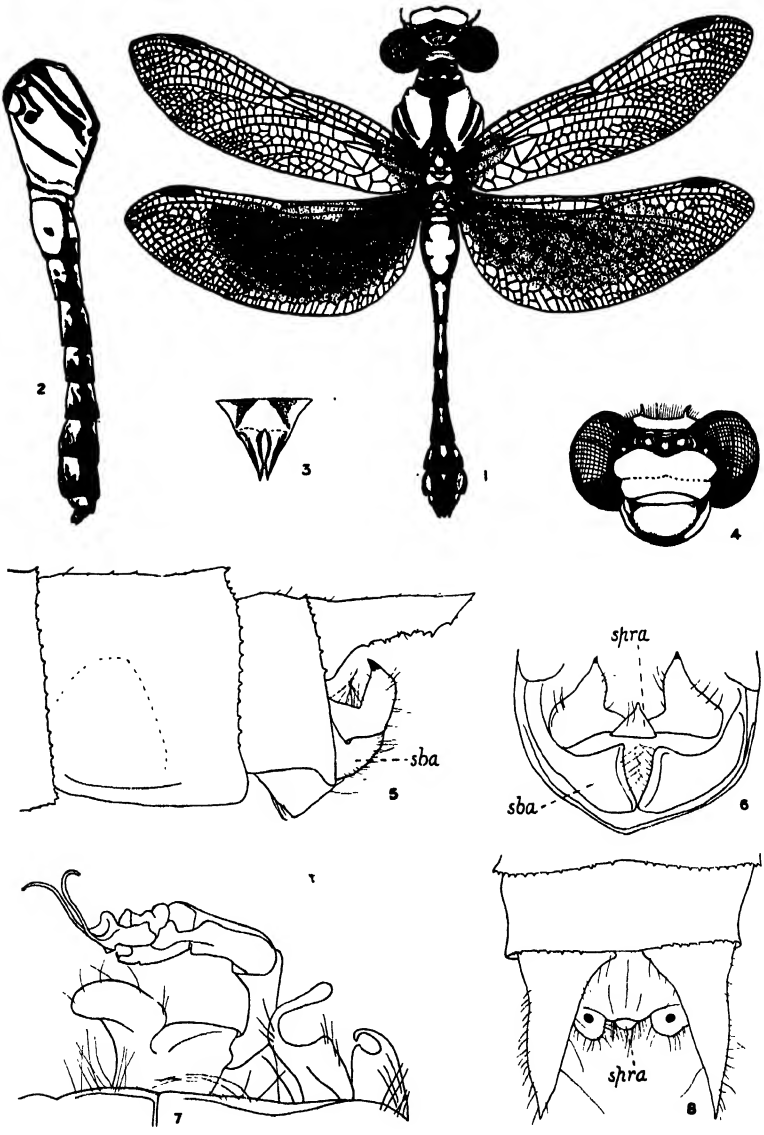
As time goes on more interest is taken in plant life for ornamental purposes, and injurious insects are rapidly increasing and it is very important to save the trees and shrubs from destruction. People are becoming more observant and seeking information to remedy this evil. This work by Dr. Felt has 256 illustrations which add greatly to the value. We are pleased to see that he gives the reader some idea of the size of the insects discussed. In many publications the lay reader does not know from the illustration whether the insect is microscopic or an inch long. The 382 pages are on good paper and the descriptions are concise and admirable. If the reader wishes fuller accounts he is referred to Government and State reports. Control and remedial measures are given and keys to the injuries to indicate the probable culprit. The arrangement is good and the book will be very useful to those persons who do not have access to large entomological libraries.

## Doings of Societies.

### Entomological Society of France.

At its meeting on December 12, 1923, the Entomological Society of France elected three honorary members, two French, Messrs. Charles Alluaud and Pierre Chretien, in place of Paul Mabille and Achille Raffray, deceased, and one foreign, Dr. J. [illegible]rdin, of Geneva, Switzerland, in place of Dr. David Sharp, d[illegible]d. Dr. L. O. Howard is now the only representative of the [illegible]glish-speaking countries among the fourteen honorary memb[illegible] of this Society.

The Budget of the Society for 1924, as modified at its meeting of February 13, 1924, estimated the receipts at 30,200 francs and the expenses at 34,100 francs.




OPHIOGOMPHUS HOWEI.—BROMLEY.

# ENTOMOLOGICAL NEWS.

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV DECEMBER, 1924 No. 10


CONTENTS



## A New Ophiogomphus (Aeschnidae : Odonata) from Massachusetts.*

By S. W. BROMLEY.

(Pl. XI, Figs. 1-4)

On June 1, 1922, a small *Ophiogomphus* was collected in Amherst, Massachusetts, by Howard Norwood, a student in Entomology, on the campus of the Agricultural College, in front of one of the buildings. In appearance it was quite unlike any species of this genus that had come to my notice.

Although but one individual, a female, has been obtained, it seems sufficiently distinct to merit description. It was at first referred to *O. aspersus* Morse, but is much shorter and more robust than that species, besides having its hind wings proportionately broader, with a large flavescent area which is lacking in *aspersus*. It differs also in the position and coloration of

*Contribution from the Entomological Laboratory of the Massachusetts Agricultural College, Amherst, Mass.

the occipital horns and in the conformation of the vulvar lamina.

In *O. aspersus* the occipital horns are located back of the occipital ridge close to the compound eyes, and are brown in color. In *O. anomalus* Harvey, in addition to a pair similarly placed, there are two in the center of the occipital ridge, their bases closely approximate and tips contiguous. In the present species, the only occipital horns are a pair located on the ridge of the occiput, their bases widely separated and tips divergent, of the same color as the occiput with the exception of the tips, which are dark.

The species is named in honor of Dr. R. Heber Howe, Jr., whose writings on the Odonate fauna of New England have done much to encourage the study of this interesting order in this region. The description is made from the single individual taken June 1, 1922, which is in the collection of the Massachusetts Agricultural Experiment Station.

**Ophiogomphus howei** sp. n.

♀ Total length, 31 mm. Abdomen, 22 mm. Hind wing, length, 21 mm.; greatest breadth, 8 mm. Fore wing flavescent from base to slightly beyond the arculus. Hind wing flavescent over basal two-thirds of wing. Pterostigma brown margined with black. Rest of wing hyaline.

Head: Clypeus, genae, occiput and anterior aspect of frons, olive-yellow; vertex and posterior dorsal aspect of frons, black.

Head back of eyes, black dorsally; olive-yellow below.

Occipital horns located on ridge of occiput, separated, tips divergent; basally, olive-yellow, tips dark brown. Several rows of slender, black hairs along ridge of occiput.

Thorax in life, green, turning olive-yellow when dried, with brown markings. Prothoracic legs black, with exception of the femur, which is pale green below. Mesothoracic legs black with pale green line on posterior side of femur. Metathoracic legs black with proximal ventral portion pale yellow.

Abdomen black and olive-yellow. Vulvar lamina with slender lobes, the apical teeth of which are parallel. In contour they approach *O. colubrinus* Selys., a species entirely different in other respects.

EXPLANATION OF PLATE XI.

Fig. 1. Dorsal aspect, showing color pattern.

Fig. 2. Lateral aspect of thorax and abdomen, showing color

Figs. 1-4. *Ophiogomphus howei* n. sp., female, type. × 2.

pattern.

Fig. 3. Vulvar lamina.

Fig. 4. Frontal aspect of head, showing position of occipital horns.

# The Supposed Male of Ophiogomphus howei Bromley (Odon.: Aeshnidae).

By PHILIP P. CALVERT, University of Pennsylvania, Philadelphia, Pa.

(Pl. XI, figs. 5-8).

In 1921, Mr. A. B. Champlain, Curator of Insects, Bureau of Plant Industry, Department of Agriculture, Harrisburg, Pennsylvania, placed in my hands some Odonata for identification. Among them was a small male *Ophiogomphus* from Lemoyne, Pennsylvania, which, after study, I labeled as "Ophiogomphus sp. near anomalus Harvey" and laid aside in the hope that additional material might be forthcoming. In December, 1922, Mr. S. W. Bromley asked me to examine the female from Amherst, Massachusetts, which he has now described in the preceding paper. I came to the conclusion that the Lemoyne male and the Amherst female were probably conspecific. By arrangement with Mr. Bromley I am now printing the description of the male following that of his female.

**Ophiogomphus howei** Bromley.

♂. Differs from the description of the female type in having the flavescent area of the wings very faint (this perhaps due to the comparative youthfulness of this individual); no occipital horns; clypeus, genae, occiput and frons (except at the base, superiorly, of the last named) a clearer yellow than olive yellow; vertex and frons superiorly at base brown; head back of eyes brown dorsally, a clearer yellow below; thorax of a clearer yellow than olive yellow, markings brown, not black, of the form shown in Plate XI, fig. 1; mid-dorsal thoracic brown stripe .8 mm. wide, brown antehumeral .57 mm. wide; brown humeral .4 mm. wide, faintly divided lengthwise by a pale yellowish line along the suture; lateral dark thoracic markings not as distinct as in Pl. XI, fig. 2. Abdominal markings, as compared with Pl. XI, fig. 1, have the trilobed yellow on the dorsum of 2 not as deeply incised; postbasal widening of the dorsal olive yellow on 3 not evident; the dorsal olive yellow on 4 reaching to only one-third of the length of the segment; mid-dorsal stripe on 7 narrower (.25 mm. wide), one-third as long as the segment.

Length 34 mm., abdomen 24, superior appendages 1.27, hind wing 19 mm.

Differs from the male type of *Ophiogomphus anomalus* Harvey, as described in Ent. News, IX, p. 60, March, 1898, as follows:

Smaller; no dark line on fronto-clypeal suture, no dark bands on the clypeus (nasus and rhinarium) or on the labrum, except that the free margin of the latter has a narrow blackish brown stripe.

Antehumeral brown stripe not reaching the ante-alar sinus, hence not connected above with the mid-dorsal brown stripe and connected with the humeral by a point only at a short distance below its own upper end (= .8 mm. below the ante-alar sinus). Brown line on the upper and lower ends of the obsolete first lateral thoracic suture separated by an interval of 1.5 mm. Brown stripe on the second lateral thoracic suture complete but less distinct. Humeral brown stripe connected at its upper end with the mid-dorsal stripe by a brown line along the upper margin of the mesepisternum and by a narrow brown stripe with the line on the first lateral suture along the upper margin of the mesepimeron.

Wings pale yellowish in the basal half, especially in the hind wings, stigma very pale yellowish, probably immature.

Legs brown, first femora much paler (yellow) inferiorly than the others.

Abdomen blackish brown, mid-dorsal and lateral yellow stripes not confluent at the bases of the segments ["segments 3-9" in Prof. Harvey's description is probably an error for 3-7], mid-dorsal yellow stripe on 8 cuneiform, apex caudad, one-third as long as the segment, that on 9 reduced to a minute basal spot and absent on 10. Width of segment 8 at base 2.15 mm., abdomen somewhat distorted. Superior appendages luteous, tapering to the apex in dorsal view, more so on the outer (lateral) side, apex acute. The appendages are shown in Pl. XI, figs. 5, 6 and 8, the genitalia of segment 2 in fig. 7.

Compared with the description of *O. anomalus* in Ent. News XII, page 240 (Sept., 1901), the pit on the side of the ninth segment is in the brown area above the C-shaped yellow.

Described from a single male taken at Fort Washington, Lemoyne, Pennsylvania, May 20. Mr. Champlain wrote: "The unique male that you mentioned (5960b) was collected by H. O. Marsh at Lemoyne. Fort Washington is the name of a hill at Lemoyne, which during the Civil War was made into intrenchments for the protection of Harrisburg across the [Susquehanna] river."

Thanks to Mr. Champlain, this male has been placed in the collection of The Academy of Natural Sciences of Philadelphia.

EXPLANATION OF PLATE XI.

Figs. 5-8. Supposed male of *Ophiogomphus howei* Bromley.

Fig. 5. Left lateral aspect of the hind end of the abdomen; the dotted line on segment 9 shows the outline of the yellow spot. × 17.3.

Fig. 6. Caudal aspect of the same, ventral parts only.

Fig. 7. Left lateral aspect of the genitalia of the second abdominal segment, penis extruded.

Fig. 8. Dorsal aspect of the hind end of the abdomen. In figs. 5, 6 and 8 the black-tipped apices of the inferior appendage furnish good landmarks for comparison; *sba*, subanal laminae; *spra*, supraanal lamina.

## A Bee Collecting Trip to Chimney Rock, Wyoming.

By T. D. A. COCKERELL, Boulder, Colorado.

### With the Description of a New Species of Osmia.

By GRACE A. SANDHOUSE.

On the seventeenth day of May, 1924, my wife and I had the pleasure of visiting Chimney Rock, Wyoming, in the company of a group from the University of Wyoming. The party included Dr. and Mrs. E. B. Payson, botanists; E. C. Harrah, zoologist; C. L. Corkins, entomologist; Dr. J. E. Downey, psychologist; and several others. I had never collected an insect in Wyoming before, and the country visited, although in Albany County and only a short distance from the Colorado line, was unlike any I had seen. It consists of wide, dry valleys and plains, with a few small streams, and at the sides huge masses of red sandstone rock, carved into grotesque shapes, and with the stratification horizontal. The snail *Oreohelix cooperi* (W. G. Binney) was found in some abundance. The most conspicuous flower was *Mertensia humilis* Rydb., a very beautiful thing with deep blue bells, new to me in life. Curiously, it is so closely related to an alpine species that its distinctness as a species is questioned. The flora in general is that of the Transition Zone, and with Dr. Payson's help I made the following list of characteristic species:

*Yucca glauca* Nutt., *Fritillaria atropurpurea* Nutt., *Odostemon repens* (Lindl.), *Delphinium nelsonii* Greene, *D. geyeri* Greene, *Cheirinia aspera* (Nutt.), *Astragalus caespitosus* (Nutt.), *Viola nuttallii* Pursh, *Betula fontinalis* Sarg., *Cercocarpus montanus* Raf., *Phlox glabrata* (E. Nels.), *Lithophragma bulbifera* Rydb. (form with pink flowers), *Townsendia exscapa* (Richards.), *Pediocactus simpsoni* (Engelm.), and *Tetradymia inermis* Nutt.

On the *Tetradymia* (det. Payson) were white wooly galls, resembling those found on *Atriplex*. The species is evidently new.

The bees were collected by Mr. Corkins and Mrs. Cockerell, while I hunted snails and various insects. The series is a small one, but contains some novelties. There can be no doubt that more extensive collecting in this region would bring to light a number of undescribed forms. There has never been a resident collector of bees in Wyoming, though Dr. Lutz has visited the State and obtained many interesting species, including seven forms which I have already published as new, while a few others are in course of publication.

BOMBUS HUNTII Greene. One female.

ANTHOPHORA SIMILLIMA Cresson. One male, with pure black eyes.

TETRALONIA MEDICATA Cockerell. One female, at flowers of *Mertensia humilis*. This species got its name from the fact that it was discovered at Medicine Hat, Alberta. By a curious coincidence, it was next found, by Dr. Lutz, at Medicine Bow, Wyoming.

**Andrena dolichotricha** new species.

♂. Length about 9 mm., anterior wing 8.4 mm.; black, moderately robust, the head and thorax with very long erect hair, which is entirely pale, but delicately tinged with ochreous, this tint perhaps most pronounced on the mesopleura.

Head large, facial quadrangle broader than long; clypeus shining, but very densely and distinctly punctured, and with no smooth line; mandibles ordinary, short, reddish at end; process of labrum truncate; malar space linear; cheeks flattened, covered with very long hair, but not angulate; vertex broad and dull; antennae black, long and stout, moderately shining, the flagellum submoniliform; third and fourth joints equal (each

320 microns), the third with very short reddish hair on outer side.

Mesothorax and scutellum shining, with strong but not dense punctures; the punctures on mesothorax tend to run in longitudinal lines; area of metathorax well defined, truncate behind, and with about sixteen distinct but obtuse longitudinal ridges; under the microscope the surface of mesothorax is seen to be tessellate between the punctures, not polished; tegulae piceous.

Wings long, hyaline, with a faint brownish tint, more pronounced at apex; stigma large, bright ferruginous; nervures dusky reddish; basal nervure meeting nervulus; second cubital cell receiving recurrent nervure a little beyond middle.

Legs mainly black, with long hair like that of thorax, but all the tarsi reddish apically, hind tarsi entirely red, and their tibia red at apex, or the legs may be entirely black, except the last joint of tarsi; hair on inner side of hind tarsi creamy white.

Abdomen shining, the surface under a lens appearing finely roughened, but not distinctly punctate; the whole surface covered with rather long, thin, erect, white hair, only forming bands, and these not very distinct, at sides of third and fourth segments; second segment depressed one-half; apex without special features.

Chimney Rock, Wyoming, May 17, 2 males (W. P. Cockerell and C. L. Corkins).

This is a member of Viereck's subgenus *Scrapteropsis,* but not very similar to any known to me. In Bruner's table it runs straight to *A. sayi* Rob., and, although that is a very different species, with much larger head, longer mandibles and less hairy abdomen, there is apparently some relationship, as shown by a certain similarity in the area of the metathorax. Superficially, there is some resemblance to *A. tacitula* Ckll., but that is smaller, with distinctly punctured abdomen.

**Andrena transnigra paysoni** new subspecies.

♀. Wings dilute greyish (strongly reddish in *A. transnigra* Viereck); stigma slender, clear red with dark margin; face with abundant white hair; occiput with white hair; a band of light hair extending down front of mesopleura; hind femora with much long, pure white hair beneath.

Chimney Rock, Wyoming, May 17, 1 female, taken by C. L. Corkins on the ground in a dry place.

ANDRENA ERYTHROGASTRA (Ashmead). Three males, at willows.

PARANDRENA ANDRENOIDES (Cresson). Five males, 3 females, at willow.

PARANDRENA ANDRENOIDES BICOLOR Rob. Four females, at willow.

SPHECODES SOPHIAE Cockerell. One female, with head not so broad as in type. I have commented on the variability of *S. sophiae* in *Entomologist,* 1904. p. 232, and suspect that when the males are known the species as now understood may be divided into two or more.

NOMADA CIVILIS Cresson. One male.

NOMADA (s. str.), two species, males. These must await the time when the accumulated materials in this difficult group can be revised.

A new *Osmia* collected is described below by Miss Sandhouse. The types of the new forms are in my collection, but will later go to the U. S. National Museum.

Since we returned home, Professor Payson has sent species of *Andrena* and *Halictus* which he collected a few days later. The *Andrena* is a remarkable and very distinct species.

**Andrena metea** new species.

♂. Length about 10.5 mm.; intense black, with entirely black hair, long and erect on head and thorax; clypeus high, polished, weakly punctured, yellowish-white, with a pair of conspicuous black spots; facial quadrangle broader than long; labrum polished, elevated in middle (but without a distinct process), and beneath the elevation a large deep pit from which hairs project; malar space a well-developed shining band; third antennal joint about or almost as long as next two together.

Mesothorax and scutellum dull, with sparse weak punctures; area of metathorax triangular, dull, not plicate; anterior trochanters not modified; mesopleura dull; tegulae black.

Wings brownish hyaline; stigma rather slender, dark reddish; nervures fuscous; basal nervure meeting nervulus; second cubital cell broad, receiving recurrent nervure beyond middle.

Abdomen dullish, finely rugosopunctate, second segment depressed about a third. Under a lens, I thought I could see a spine on the hind trochanter, but it turned out to be a tuft of closely appressed (pencil-like) hairs.

Laramie, Wyoming, May 24, at flowers of *Astragalus caespitosus;* collected by E. B. Payson and E. C. Harrah. Nearest, apparently, to *Andrena maura* Vier., but easily known by the entirely black hair.

# Description of a New Species of Osmia. By Grace A. Sandhouse.

**Osmia corkinsi** Sandhouse, new species.

♀. 9-10 mm. long; blue-green, the face, mesothorax and scutellum quite brassy green; scopa black.

Head normal; inner orbits converging slightly below; face closely punctured, the punctures deeper on the supraclypeal area; pubescence black, except the hair of the front, is largely, and that of the occiput entirely, pale fulvous; antennae black; clypeus very dark blue-green, the anterior margin truncate but slightly concave; mandibles black, tridentate.

Dorsum of thorax very closely and rather coarsely punctured, the pubescence fulvous; disk of propodeum dull and very dark blue-green; tufts of hair behind wings fulvous; hair of pleura and sides of propodeum black; tegulae black, the anterior portion greenish and punctate, with some pale hair on the margin.

Wings hyaline; anterior wing about 6.5 mm. long; basal nervure meeting nervulus; second cubital cell little longer than the first on marginal, receiving first recurrent nervure about one-fourth from the base and the second recurrent nervure one-fifth from the apex.

Legs black; pubescence black, except for some reddish hairs on the anterior and middle basitarsi; hind tibial spurs weakly curved; hind femora obscurely metallic.

Abdomen rather broad, shining; bases of segments with piliferous punctures; punctureless apical margins of segments narrow; hair of first dorsal segment white except for patches of black at the extreme sides, of second segment black with some white intermixed, especially on the median base, of segments 3-6 black.

Chimney Rock, Albany County, Wyoming, May 17, (C. L. Corkins). The plant from which this specimen was taken was not recorded, but some pollen from the scopa was examined by Miss Pope and showed the bee had visited *Astragalus* and *Mertensia,* probably *M. humilis.*

Paratype—Boulder, Colorado, May 26, at *Aragallus lambertii* (M. D. Ellis). This differs from the type only in having the face and tegulae bluer."

"Very similar to *subtrevoris* Cockerell, by the brighter hair on the scutellum; more closely punctured abdominal segments, with narrower punctureless apical margins; mesothorax and scutellum brassy green; tegulae metallic in front; basal nervure meeting nervulus, behind the nervulus in *subtrevoris;* some pale hair on front, entirely black in *subtrevoris;* the tongue is much shorter than that of *subtrevoris.*"

## Carbon Tetrachloride for the Entomologist.

By J. R. de la Torre Bueno, White Plains, New York.

The entomologist in the technique of the collection meets with certain problems. Two of these are pests and grease.

Heretofore, grease has been removed from insects by immersion in gasoline, benzine, chloroform or ether, all excellent solvents. Pests have been destroyed with carbon bisulphide.

Gasoline and benzine are highly inflammable. The latter is true also of carbon bisulphide, the vapor of which forms explosive mixtures with air and besides is poisonous to human beings.

Carbon tetrachloride ($C\,Cl_4$) is a universal liquid to replace all those mentioned. Chemically it is defined as a colorless mobile liquid much heavier than water. It boils at about 170° F. and freezes at 13° F. It evaporates rapidly at room temperature without leaving a residue. It is, in addition, an excellent solvent of oils; uninflammable and non-poisonous to human beings. All these properties make it extremely useful and safe for entomological purposes.

When first introduced in 1864 it was used as an anesthetic. Unfortunately, in obscure heart cases it was attended with fatal results, leading to its abandonment. In late years, because of cheapness of production, it has come into varied commercial uses. To most people it is familiar as a cleaning fluid to remove spots; and as material for fire-extinguishers. In industry it is used as a solvent for oils and resins and as a degreaser. It removes oil and grease spots more rapidly than gasoline.

### Degreasing Insects.

Carbon tetrachloride has been used very successfully by me in degreasing bugs. Certain forms seem very liable to get greasy, especially well-fed specimens taken in late summer. Such greasy specimens are not only unsightly but also conceal minute characters by reason of the dirt that gathers on them. If such dirty insects are only dusty, they may be put pin label and all into a tightly covered small wide-mouthed bottle and *shaken,* without fear of breaking of legs and antennae. The dust will be washed off, and when the insect is dry it will be found beautifully clean. If only slightly greasy, about half

an hour will clean them, and they may be taken out and allowed to dry, which they do very quickly. If specimens are very greasy, they may be allowed to remain in tetrachloride overnight or even longer. This last is necessary where verdigris has attacked the pins. However, pinned insects should not remain too long in the liquid as it seems to have a solvent effect on brass pins. Some bugs neglected for a few weeks had the pins melted right off. The best practice is to degrease in one vessel and then pass through two others, to wash off the last traces of greasy tetrachloride.

This has not been tried by me on Lepidoptera, and tetrachloride, I have been told, changes the color of Orthoptera.

### Washing Insects.

Hard bodied insects may be *washed* in tetrachloride by means of a fine camel's hair brush. Mold on valuable specimens may thus be removed entirely. This washing should be done in three vessels. The dirty or moldy insect is thoroughly soaked in the first and the greater part of the dirt or mold removed. It is then transferred to the next, and gone over under the magnifying glass, and finally rinsed in the third vessel. I have done this to such minute insects as *Microvelia* with good results.

These washings, of course, destroy any pests.

### Destruction of Pests.

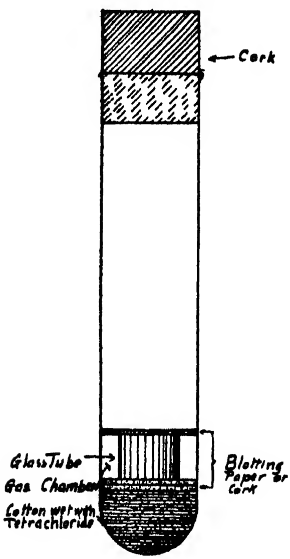
*Anthrenus* is always with us and others as well. Infested boxes may be disinfected by pouring in a little tetrachloride—say a teaspoonful—into the box and closing it. Even though the fumes do not at once kill the pests, and although they evaporate in a couple of days, the larvae of *Anthrenus* lose all interest and finally just naturally languish and perish without doing further injury. The tetrachloride also may be directly dropped on the injured insect without spoiling it.

This is excellent for private collections as tetrachloride is not only entirely safe, but it has a rather pleasant odor when pure. For museums it may have one part in four of the poisonous bisulphide, which makes it more deadly, but still relatively uninflammable.

### Tetrachloride Killing Bottle.

In its simplest form, the tetrachloride bottle may be prepared by putting absorbent cotton wet with it (not soaked and dripping) in the bottom of any bottle or tube, holding it down with rounds of blotting paper or pieces of sheet cork fitting tightly within the inside diameter of the bottle. Such bottles or tubes may be made ready just before starting collecting and will last several days.

Much experimenting since before 1915 has resulted in my improved tetrachloride killing bottle. The foundation is, of course, the tetrachloride wet cotton. This is held down as before mentioned. Above the blotting paper or cork is a space partitioned off from the rest of the bottle by another round of blotting paper or cork, in the case of small tubes. When the tubes are large, and in the case of bottles of greater diameter, a short piece of glass tubing about one-half to three-quarter inch long is put above the charge and the blotting paper or sheet cork rests on this, thus forming a gas chamber.




There is, of course, a reason for this. In very warm weather the tetrachloride evaporates rapidly and, naturally, the charge in the tube is very strong. But it also condenses at any decrease of temperature, thus wetting delicate insects. There is also great waste of the vapor. The gas chamber, however, retains this super-charged vapor and prevents it from so filling the bottle as to condense on the sides. Thus the insects remain dry and the tube lasts longer. (See figure.)

However, in actual collecting practice, it is well to put small and delicate insects into small tubes without a charge. Then the tetrachloride gas may be poured into the small tube from the

regular with full, if slow, effect. It is a most rapid killing agent for Diptera.

It is stated that the tetrachloride changes the color of delicate Orthoptera. I have not noted this. Doubtless, if it occurs, it is because the insects get wetted with the condensation. Tetrachloride of carbon sometimes contains excess free chlorine which, of course, is a powerful decolorizing agent.

Insects may be left in such a bottle overnight without stiffening.

## Two New Phoridae from the Eastern United States (Diptera).

By J. R. MALLOCH, Biological Survey, Washington, D. C.

During the past three years collections have been made with a view to compiling a list of the Phoridae of the District of Columbia and amongst the material taken there are some specimens which belong to undescribed species, two of the most interesting of the latter being described herein. The types are in the author's collection.

**Aphiochaeta apicinebula** sp. n.

♀. Yellow, slightly shining. Basal abdominal tergite brown, next tergite very large, lemon yellow, third tergite small and pale, remainder of abdomen fuscous. Legs, including coxae, entirely yellow. Wings yellowish, veins pale brown, tip of costa darker, a slight but distinct narrow infuscation round apex of wing. Halteres yellow.

Frons subquadrate, with numerous short black hairs, central impressed line distinct, both series of transverse bristles convex, the inner bristle of anterior series about midway between outer one and the postantennal bristle, only one pair of postantennal bristles present; third antennal segment round, not very large; arista pubescent; mouth margin arched, protruded centrally almost as far as apex of third antennal segment; about four fine black bristles on lower part of sides of face; two strong bristles on lower part of occiput and some shorter bristles above them; proboscis stout; palpi normal, moderately bristled.

Scutellum with two bristles and two short basal setulae; mesopleura bare.

Second abdominal tergite very large, bare, covering at least half of dorsum; apex of abdomen furnished with a rounded scoop-like process which is slit in center at apex.

Fore tarsus a little longer than tibia, basal segment as broad as tibia; a few short black setulae on basal half of ventral surface of hind femur; mid and hind tibiae each with a complete series of posterodorsal setulae and a similar series of setulae on basal half or more of anterodorsal surface.

Costa to almost two-thirds of the wing length, fringe not longer than costal diameter, first section slightly shorter than second, third very short, not more than one-eighth as long as second; fourth vein leaving third at fork of that vein. Body length, 3 mm.

*Type,* Glen Echo, Maryland, July 23, 1922. *Paratype,* topotypical, June 15, 1924 (J. R. Malloch).

This species belongs to the same group as *subpicta* Malloch and differs from that species in color of wings, coxae and abdomen, as well as in chaetotaxy of frons and scutellum.

The most closely related American species appears to be *sulphuriventris* Borgmeier from Brazil, but that species, though colored much as *apicinebula,* has the second tergite deep black, halteres fuscous, wings more yellowish, lower pair of postantennal bristles present but minute, the first costal division as long as next two combined, and the fork of third vein wider.

The most remarkable character possessed by the new species consists of a short series of about six black setulae near middle of posterior surface of hind tibiae. No other species known to me has these setulae.

Several years ago I erected the genus *Paraphiochaeta* for the reception of the species of *Aphiochaeta* which have two series of setulae on the hind tibiae. This genus has been considered as a synonym of *Phalacrotophora,* but I now believe the group is not entitled to separation and consequently describe the new species in *Aphiochaeta.* This attitude is strengthened by the fact that the Brazilian species compared above with *apicinebula* belongs to *Aphiochaeta* in the restricted sense and not to *Phalacrotophora.*

**Beckerina aliena** sp. n.

♀. Head yellow, frons darkened, becoming black at upper margin. Thorax tawny yellow. Abdominal tergites fuscous, narrowly yellow on hind margins. Legs yellow, apices of hind femora fuscous. Wings slightly grayish, noticeably so at apices. Halteres yellow.

Frons distinctly broader than long, central impressed line faint, surface with numerous short black setulae; upper series of four bristles straight, lower series with the inner bristles about midway between outer pair and the pair of stout divergent postantennal bristles; postocular bristles strong on lower portion, each cheek with two strong bristles; antennae normal; arista slender, almost bare.

Mesopleura bare; scutellum with four bristles, the median pair invading disc.

Abdomen conical, practically bare.

Hind tibia with a slight hirsute dorsal ridge which is not present in other species of the genus in North America.

Costal vein becoming thicker apically, first section about 1.5 as long as next two, second about twice as long as third; seventh vein much fainter than the others; costal fringe short. Body length, 1.5 mm.

*Type,* Glen Echo, Maryland, August 10, 1923 (J. R. Malloch).

The only other yellow colored species so far known from this country is *flaveola* Malloch, described from Illinois. In my key to the species of this genus published in Brooklyn Bulletin, Vol. XVIII, 1923, p. 32, the present species will run down to *flaveola,* which differs in having the thorax trivittate with reddish, and the scutellum with but two bristles.

## A New Species of Gonia from Texas (Diptera).

By H. J. Reinhard, Amherst, Ohio.

**Gonia texensis** new species.

♂. Head, thorax and abdomen yellow in ground color. Eyes bare. Front prominent, covered with irregular rows of bristles, more than twice the horizontal eye-width, white pollinose, but when viewed in certain lights sub-shining and translucent. Ocellars, inner and outer verticals well developed, all directed posteriorly. Frontals in a single row on each side, decussate to base of antennae, lowest bristles on level with base of third antennal joint. Orbital bristles present. Cheeks, median depression and parafacials white pollinose. The latter at narrowest point three-fourths as wide as median depression, covered with short bristly hairs, and a row of stronger bristles on the lower half along the facial ridges. Antennae as long as the face, basal joints very short, yellowish, third joint blackish, elongate, front border practically straight. Arista yellowish,

bare, geniculate and thickened to tip, penultimate joint variable, usually as long as or longer than the third. Vibrissae decussate, slightly approximated and inserted nearly on level with oral margin. Median depression moderately large and very deep, ridges with three or four bristles above the vibrissae. Proboscis rather slender, labella small, yellowish. Palpi ordinary, yellow. Cheeks covered with whitish pubescence, width nearly one-half the eye-height. Beard dense, yellowish.

Thorax grey pollinose, with four black vittae when viewed from behind. Four posterior dorsocentral and four sternopleural bristles. Scutellum yellow, bristly above except along the narrow base, with three pairs of large marginal bristles directed backward, and two or three short sub-erect spine-like bristles at the apex.

Abdomen conical and rather slender, yellow, with a median black vitta. Bristles marginal only. First segment with a lateral pair; second with a lateral and a median pair; third and fourth with complete rows. Genital segments black, the second with numerous black hairs directed backward. Inner forceps united, expanded apically into a spoon-shaped structure which is slightly notched at the apex, covered with dense yellowish pubescence beneath, and a tuft of long black hairs above. Outer forceps shorter, shining black and thickly covered with hairs. Penis and claspers short and blunt. Fifth sternite deeply and widely cleft, without any special modifications.

Legs black, basal joints yellowish. Middle tibiae with three or four bristles on the outer front side, hind tibiae ciliate. Claws and pulvilli short.

Wings normal, infuscated along the veins and toward the costa. Third vein bristly half-way to small cross-vein, all others bare. Apical cell open, ending far before tip of wing. Fourth vein strongly arcuate beyond bend, without stump or fold. Calypteres white. Total length 9-12 mm.

♀. Similar to male, differing principally in having second antennal joint equal to about one-half length of third.

*Type,* male, deposited in the United States National Museum, Washington, D. C. Described from a long series of both sexes, collected at College Station, Texas. (H. J. Reinhard.)

In relationship this species is probably nearest to *angusta* Macquart, which in Aldrich's catalogue is listed as a synonym of *pallens* Wiedemann, described from Brazil. The genitalic characters will best serve to separate the species from its congeners in our fauna.

## *Polyommatus filenus* Poey (Lepid. : Lycaenidae).

By William C. Wood, New York City.

In February, 1920, I took, at Jupiter, Florida, two specimens, a male and a female, of a small "blue," which for a long time I assumed to be the very common *Hemiargus hanno* Stoll. But the very different "facies" of these specimens finally suggested that they are something else, and an examination of Poey's original figures and description, which I was recently enabled to make through the kindness of Mr. Watson, seems to prove conclusively that they are the insect described by Poey as *Polyommatus filenus*. Poey's description, in Cent. Lep. Cuba, 1832 (Pl. 2), is as follows:

"Polyommatus filenus. The wings of the male, on the upper side, are a brilliant blue with brown border; those of the female brown, with the base blue; on the under side they are grey, with brown markings ('lignes') bordered with white: the inferiors have three black dots towards the base, and three ocellated spots, with brilliant blue pupils, near the anal angle; the outer one with tawny ('fauve') margin. The fringe is white."

My specimens agree closely with this very brief description, except that only one of the three "ocellated" spots on the under side of the hind wings has a noticeable blue pupil, and that the basal area of the fore wings in the female is grey, not blue. They resemble the figures in general aspect very closely. While the whole appearance is different from that of *hanno* Stoll, certain points of difference may be noted, as follows: First, as to color. The male of *hanno* is of a delicate violet blue, much like that of *comyntas*, while *filenus* is of a shining, silvery, almost metallic blue. The dark margins of the wings in *hanno* are very narrow and of uniform width throughout, while in *filenus* they are nowhere less than 1.5 mm. wide. The tips of the fore wings are heavily shaded, and the dark color extends along the costal margin nearly half-way to the base of the wing. The costal margin of the hind wings is heavily shaded from base to outer angle. Within the outer margin of the hind wings is a row of round dark spots of the same color as the marginal shading and touching it, giving the effect of dentation

inwardly. On the under side *hanno* and *filenus* are very similar. In *filenus* the three white-encircled black dots near base and costal margin of secondaries are larger and blacker than in *hanno*. The discal band of whitish spots crossing both wings is in *filenus* narrower than in *hanno*, and more distinctly bent downwards before ending at the anal angle. The submarginal row of brownish spots is much the same in both species.

In the female, *filenus* has the central area of the fore wings dark grey; of the hind wings deep metallic blue. The heavily shaded tip and costa of the fore wing, the shaded costa and the submarginal spots of the hind wing follow the pattern of the male, but the whole tone is dark and more obscure. On the under side the post-discal band of whitish spots is conspicuous and brilliant, and attains the costal margin of the fore wings, not becoming fainter costad as it does in *hanno*. On the hind wings this band is strongly angled at vein L R, wherein it differs greatly from *hanno*. Expanse of both sexes 21 mm.

The history of *hanno* Stoll, and of *filenus* Poey, may be briefly sketched as follows: (The order followed is from Skinner's Synonymic Catalogue, 1898).

*Hanno* Stoll, Suppl. Cram. 1791. The description is somewhat vague, and the figures (t. 39. f. 2, 2B) crude, but they can reasonably be considered to describe what is now called *hanno*. Habitat is given as Surinam and the Cape of Good Hope.

*Antibubastus* Hub., Zutr. Exot. Schmett., 1818. The figure of the upper side might be *hanno*, but that of the under side is very crude, and lacks the prominent spot near the anal angle of the secondaries which is the most striking feature of *hanno*. "From Georgia in Florida!"

*Hamo* Lucas., Sagra Hist. Nat. Cuba, 1856. The description of the male (p. 612) fits *hanno* pretty closely. That of the female would better apply to *filenus* Poey.

*Pseudoptiletes* Bdl.-Lec., Lepid. Am., Sept., 1833. The figures (t. 35) seem to me distinctly recognizable as *filenus* Poey.

(Dr. Barnes, in the "Contributions," Vol. III, No. 2, 1916, p. 108, states that the species here figured is certainly our Floridan one. I have seen these figures and cannot agree that they

represent *hanno*. They do resemble Poey's figures of *filenus* Poey.)

*Astenidas* Bdl., MSS. Lucas Sagra Hist. Nat. Cuba, 1856. The description of the male might pretty well be of *filenus*. That of the female is not recognizable to me, as mention is made of spots on the upper side of the wings.

*Filenus* Poey, Centuria Lepidop. Cuba, 1832. (Description repeated in full supra.)

The other references to *filenus* Poey are as follows:

Boisduval and Leconte, Lepid. Am., Sept., 1833. As mentioned above under *pseudoptiletes* the descriptions and figures are without doubt of *filenus* Poey.

Check List, Brooklyn Ent. Soc., 1882, p. 4. The name *filenus* is used to connote *hanno*.

Edwards, Catalogue of North American Lepidoptera, 1884. p. 65, name *filenus* is here used to connote *hanno*.

Aaron, Papilio, 1885 (p. 4). *Lycaena antibubastus*—Synonyms, *Lycaena filenus* and *Rusticus adolescens hanno* Hub.

French, Butterflies of the Eastern United States, 1886 (p. 294). *Lycaena filenus* Poey. His description of the male is plainly that of *hanno*. Of the female it is hard to say what is described, since he speaks of "the middle area of the basal half of both wings" as "washed with blue." Some females of *hanno* Stoll have this area shot with green dashes, and my specimen of *filenus* Poey ♀ has a blue central field on the secondaries only.

There seems to me to be no doubt that *filenus* Poey is a valid species, entirely distinct from *hanno* Stoll. It is probably rare in Cuba, as it certainly is in Florida. Otherwise its striking difference from *hanno* would surely have prevented the confusion which has, since 1884, sunk it into the synonymy of *hanno* Stoll.

I wish to record my indebtedness to Mr. Frank E. Watson, of the American Museum of Natural History, for his assistance, particularly with the literature referred to, and to my friend, Dr. Charles T. Ramsden, of Guantanamo, Cuba, for a series of *hanno* which he very kindly collected for me, for comparison with our native form, with which it agrees closely.

## Ratios between the Food Habits of Insects.

By Harry B. Weiss, New Brunswick, New Jersey.

In the *Ohio Journal of Science* for March, 1924 (Vol. XXIV, No. 2, pp. 100-106) under the title "Insect Food Habits and Vegetation," the suggestion was made that when large areas embracing different types of vegetation are considered *in toto* and that when the numerical ratios between the insect species and the factors tending to reduce their numbers are considered as constant or at the most fluctuating within limits which do not allow of any serious disturbance of the natural balance, the ratios between the various types of food habits are approximately identical or vary but little in all such areas. This was based on a tabulation of the food habits of some 10,500 species listed from New Jersey and 400 species from different parts of the Western Arctic Coast of America as collected and reported by the Canadian Arctic Expedition. Since the publication of this paper, the insects of Connecticut, as listed by Dr. W. E. Britton (Bull. 31, Geol. & Nat. Hist. Survey of Conn.), have been tabulated in accordance with their food habits and the results of all three tabulations are shown in the following table.

| | Number of Species | Phyto-phagous % | Sapro-phagous % | Harpacto-phagous % | Para-sitic % | Pollen Feeders, Misc. Species % |
|---|---|---|---|---|---|---|
| Western Arctic Coast of No. A. | 400 | 47 | 27 | 14 | 10 | 2 |
| State of N. J. | 10,500 | 49 | 19 | 16 | 12 | 4 |
| State of Conn. | 6,781 | 52 | 19 | 16 | 10 | 3 |

The percentages shown in the table are strikingly similar and appear to bear out the suggestion made above concerning a fixed relation. The fact that the percentages for the Western Arctic Coast of North America based on 400 species are similar to those of New Jersey and Connecticut which are based on much larger numbers indicates that a representative sample was collected by the expedition. The 10,500 species listed from New Jersey tending as they do to represent the total number of species in that state can be considered as a more or less complete

count. The same thing can be said probably of the 6,781 species listed from Connecticut. Although I have no first-hand information, it is my impression that for many years, collections have been made in all orders in Connecticut with a view towards listing all of the species found there. Of course the term "complete count" is used relatively and numerous future additions, as for example in the parasitic Hymenoptera, would change the ratios.

The 400 species from the Western Arctic Coast of North America can be considered as a representative sample or a part from which it might be safe to draw conclusions as to the whole, in view of their similarity to New Jersey and Connecticut in the types of food habit percentages. The principle upon which such a conclusion is based is known as the law of statistical regularity, "that a moderately large number of items chosen at random from among a very large group are almost sure, on the average, to have the characteristics of the larger group." This does not imply a perfect resemblance between the sample and the large group. The statement that the 400 species referred to can be considered as representative is supported somewhat by the account of Dr. C. Gordon Hewitt, in the Report of the Canadian Arctic Expedition (1913-1918, Vol. III, Insects, Introduction), who wrote that the "collection of insects brought back by the expedition was a very representative one." If the insects were collected at random or an effort made to collect samples of everything in certain areas, which is its equivalent in deliberate selection, and no effort made to concentrate on some groups at the expense of others, then the sample may be said to be truly representative.

An effort was made to tabulate the insects from other areas, where it appeared that an attempt had been made to list all species, in order to determine if the types of food habit relationships were identical with those shown in the table. This was not successful, mainly because what appeared to be a complete count was found to be incomplete and what appeared to be a representative sample was found to be exactly the opposite. For example, in the list of the insects of Norway (Enumeratio In-

sectorum Norvegicorum, 1874-1880) by H. Siebke, which at first glance seemed promising, it was found that the parasitic Hymenoptera were missing. The list of the insects collected by the Harriman Alaska Expedition also appeared at first to fill the requirements of a truly representative sample, but it was found that some of the specialists, instead of confining their papers to the insects actually collected by the expedition, had augmented their lists by the inclusion of all known species in certain groups from Alaska. Although this practice resulted in a better picture of such groups, it destroyed the value of the list as a representative sample.

The recent list of the insects of Porto Rico (Insecta Portoricenses, Jour. Dept. Agric. Porto Rico, Vol. VII, No. 1) by George N. Wolcott, containing some 2200 species seemed to offer tabulation possibilities, but this list is, according to the author, "an attempt to summarize the records in literature of the occurrence of the insects in Porto Rico, together with the records of the collections at the two experiment stations" and some preliminary tabulation work indicated that the records of economic insects were perhaps comparatively more numerous than those of non-economic species, and this impaired the value of the list for my purpose, as it could not be considered either as a complete count or a truly representative sample.

The same objections applied to several other lists when an attempt was made to use them.

It should be understood that the apparent fixed relationships of food habit types as indicated in the table do not apply to relatively small areas where the types of vegetation are uniform. Here, the ratios between the various types of food habits (based on the species present, with the numerical ratios between the species and the factors tending to reduce their numbers considered as approximately constant) appear to vary in accordance with the type of vegetation. The questions of numerical abundance, etc., have been discussed in the paper referred to at the beginning of this article and need not be repeated here.

# A New Species of Psammophila Dahlbom and the Allotype of Psammophila valida Cresson (Hymen.).*

By Walter Carter, Division of Entomology,
University of Minnesota.

**Psammophila valida** Cresson.

♂. Robust. Length 22 mm. Abdomen mostly red. Wings hyaline.

Head broad. Inner margins of eye slightly convergent at base of clypeus. Clypeus projecting over the mandibles, its apical edge free; anterior margin with a slight median notch; a line of distinct but irregular punctures around margin of clypeus, remainder finely granulate; clothed with appressed silvery pubescence mixed with dark hair which becomes silvery apically. Front, vertex, occiput and cheeks also pubescent, in addition rather thickly clothed with erect hair which is dark at base and pale apically. Front, vertex, occiput and cheeks sparsely but distinctly punctured.

Thorax covered with long erect white hair. Sides of prothorax striate posteriorly. Pronotum sparsely but distinctly punctured; sericeous. Mesonotum with fairly close distinct punctures; sericeous; a median impressed line extends to middle of disk. Pleura closely and deeply punctured, except mesepimeron which is rugose. Scutellum sparsely punctate. Mesonotum striato-punctate. Sides and posterior face of propodeum striato-punctate; disk rugosely striate, with a distinct raised median line which is much more evident anteriorly than on the posterior half.

Petiole with a few rather deep punctures at base; a few slight punctures to about the middle of petiole. Ventrally over the entire length of the petiole is scattered long whitish hair; dorsally only in the region of deep punctuation; sericeous, black.

Abdomen sericeous; red ventrally except apical sternite, the first segment is mostly red but dorsally there is scattered black. The second, third, and part of the fourth abdominal segments are red; apical dorsal abdominal segments black.

Wing nervures testaceous, stigma reddish brown, tegulae sericeous.

Legs black, pollinose. Hind coxae not extending beyond the petiole. A short blunt tooth on the inner margins of the fore coxae.

---

*Published with the approval of the Director, as Paper No. 492 of the Journal series of the Minnesota Agricultural Experiment Station.

*Allotype*, Lethbridge, Alberta, August 6th, 1923 (H. L. Seamans). Deposited in the Canadian National Museum, Ottawa. Six other specimens collected at the same time and place (H. L. Seamans and Walter Carter). One from Brooks, Alberta, July 27th, 1923. (H. L. S.).

One of these specimens has the second cubital cross vein of the right wing forked, making a small extra cell. There are also slight differences in the anterior margin of the clypeus between the specimens, some being more irregular than the allotype.

**Psammophila nicholi** nov. sp.

♀. Slender. Length 17 mm. Distinctive because of its bright red legs and shining red abdomen. Body hairs white.

Head broad, shining. Clypeus convex, truncate, the truncation laterally with a distinct tooth; deeply punctured. Clypeus at sides and basally silvery pubescent. Front silvery pubescent. Front, vertex, occiput and cheeks with fine sparse shallow punctures. A small triangular area in front of fore ocellus impunctate. A distinct median impressed line from between antennae to fore ocellus. Antennal joints distinctly granulose (under high power, appear punctate). Scape pubescent, the pubescence intermixed with long erect white hair. Long erect white hair covers thorax, except dorsally, posterior to the pronotum; there, the hair is sparse, scattered and short.

Prothorax very finely and sparsely punctured; shining. Sides of prothorax with a few striae. Prothoracic lobes fringed with short white hair. Mesonotum shining, punctures distinct and well separated. Mesopleura rugoso-punctate. Scutellum shining; striated on posterior half, sparsely punctured anteriorly. Metanotum sparsely punctured; shining. Sides of propodeum rugose. Disk of propodeum striate, the striations oblique anteriorly and transverse posteriorly. A raised median line which is more distinct anteriorly, connects the striae. Postero-lateral angles of propodeum with sparse, appressed pubescence. Petiole black; a few scattered long white hairs at base; sparsely punctured at base.

Abdomen entirely red, shining.

Wings hyaline, nervures brown, stigma reddish brown.

Legs: Anterior coxae and trochanters with long white hair. On anterior tibiae this hair is pale golden, Tooth on interior margins of fore coxae digitiform. Legs, except coxae, line on anterior trochanters, middle trochanters partly, and most of hind trochanters, red.

*Holotype,* Tucson, Arizona, April 5th, 1924. Named after the collector, Mr. A. A. Nichol. Deposited in Division of Entomology Collection, University of Minnesota, St. Paul.

The table is given to show the position these two species take in Melander's key (Psyche X, 1903).

14. Legs entirely black .............................. 15
    Front and middle legs in part red; abdomen black, *morrisoni* Cam.
    Legs entirely red; abdomen entirely red, *nicholi* nov. sp.
15. Petiole of abdomen not extending beyond hind trochanters ........................ *grossa* Cress. ♂
    Petiole extending beyond hind trochanters .......... 16
16. Stout species ...................... *valida* Cress.
    Smaller species ................................ 17

## Corythucha marmorata Uhler on Seaside Goldenrod (Hemiptera).

This lace-bug was collected August 5 at Seaside Park, New Jersey, on sea-side goldenrod, *Solidago sempervirens* L. It has been recorded before as occurring on chrysanthemum and aster and as being swept from *Compositae.* The infested plants were growing between the sand dunes and many leaves showed considerable injury. In addition to adults, many fourth and fifth stage nymphs were present and recently laid eggs were found in the upper and lower leaf surfaces close to the midribs.

HARRY B. WEISS, New Brunswick, New Jersey.

## Additions & Corrections to the Hemiptera of Connecticut.

A list of corrections and additions to the "Hemiptera of Connecticut," Bulletin No. 34, Connecticut Geological and Natural History Survey, has been printed. Anyone who has received Bulletin 34 may obtain the list by applying to Mr. Geo. S. Godard, State Librarian, Hartford, Conn. Since this list was printed, Dr. Parshley has called attention to the following error, not corrected in the list: Page 768, Key to *Banasa,* transpose at end of second line "2" and fourth line "color brown.....*sordida.*" It is *sordida* that has the angles obtuse.

W. E. BRITTON, State Entomologist, Hartford, Connecticut.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., DECEMBER, 1924.

## George H. Horn and Ezra T. Cresson.

The covers of the monthly issues of the NEWS for 1924 have borne the portrait of Dr. George H. Horn, one of the first Advisory Committee of this journal, from its establishment in 1890 until his death on November 24, 1897. On July 23, 1860, when a few months past his twentieth birthday, he became a member of the Entomological Society of Philadelphia, which had been organized February 22, 1859, by Ezra T. Cresson, James Ridings and George Newman. Horn, regarded as our second greatest American Coleopterist, ranking next to John Lawrence LeConte, was president of the American Entomological Society (the new name assumed by the Philadelphia Society in 1867) from 1866 to 1868 and again from 1883 to 1897.

George Henry Horn has been dead for twenty-seven years. Ezra Townsend Cresson, with whom Horn thus early became associated, was Horn's senior by nearly two years. On October 20, 1924, Ezra T. Cresson wrote this letter in that same clear and steady long hand which the older, and some of the younger, entomologists know well:

To the Members of The American Entomological Society.
Dear Associates:

For fifty years I have had the honor of serving the Society as Treasurer. I have endeavored to fulfill this trust to the best of my ability, and now feel that this responsibility should be shouldered by another, especially as it has become impossible for me to give your accounts the attention they need. It is, therefore, with deep regret that I hereby beg leave to resign the Treasurership. On the other hand, I wish to express my sincere appreciation of the kind and thoughtful consideration which the Officers and Members of the Society have always tendered me.

Respectfully,

E. T. CRESSON.

"For fifty years!" The face of all the world is changed since 1874. And on December 8, 1913, "Mr. Ezra T. Cresson resigned the chairmanship of the Publication Committee of the Society, after having been a member of this body for more than fifty-two years, and for the greater part of this time its chairman." This and more is in the NEWS for April, 1914, and the Society "put on record its deep sense of obligation for this splendid achievement of our honored and esteemed member."

So for sixty-three years this patient, kind, mild-spoken man set up the type or read the proof of our *Transactions*, or kept the accounts and paid the bills of our Society, and much of the time did all these things—in the evenings when the ordinary day's work was done, or in such intervals of daylight when a little time could be snatched for the purpose—all voluntarily, unpaid, save in that esteem and love which his fellow enthusiasts and associates felt for him and will feel for him as long as their memories can hold the image of his life and personality.

## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### The Last Moult in Lethocerus americanus Say.

Hungerford in his Biology of Waterbugs* brings together what very little has been observed about these gigantic predaceous insects. Before 1906 I had seen the last molt in *Lethocerus americanus*, and as nothing seems to be available about this form my notes follow as made on the spot.

The nymphal skin splits lengthways along the prothorax, which is the first part of the mature insect to emerge. This slit gradually widens and the point of the scutellum comes out. By gradual heaving movements, the insect draws itself out of its skin. The color of the prothorax at this point is honey-yellow with two deeper longitudinal stripes.

The hemielytra as usual emerge folded up into a small compass and expand gradually as the insect draws them out of their sheaths. Before the wings expand, the pulsation of the dorsal vessel is visible through the dorsum. The wings proper (the second pair) are bluish-white when freshly expanded; the hemielytra yellowish-green.

*Kans. Univ. Science Bulletin, XI, (Whole series XXI, No. 17), pp. 148-151, Dec. 1919. (Appeared in 1920.)

The caudal appendages are extruded and seem to be employed in pushing the bug out of its skin. At any rate, at such times as the insect strains to get out, they have an in-and-out- motion. The legs are closely drawn up against the body; the tarsi are closely appressed against the sides; and the fore-tibae folded on the femora. It separates the limbs from the body by heaving motions.

The nymphal tracheal linings are left as a tangle of white threads at the opening through which the bug emerged.

The duration of this molt was 17 minutes, during which the insect floats back up.—J. R. DE LA TORRE BUENO, White Plains, New York.

---

## U. S. Records of Pholisora ascalaphus Staud., (Lepid., Hesperiidae).

Skinner and Williams (1922), 1923, Trans. Am. Ent. Soc., XLVIII, 298, state that the Academy of Natural Sciences, Philadelphia, possesses a small series of old specimens of this species from near Corpus Christi, Texas, a new U. S. record, the specimens having been previously confused with *P. hayhurstii* (Edw.).

Examination of the Barnes collection series standing as *hayhurstii* revealed ten specimens of *ascalaphus*, as determined by Godman and Salvin and Skinner and Williams, from San Benito, Brownsville, San Antonio, and Houston, Texas.

Specimens from Kerrville and Black Jack Springs, Texas, appear referable to normal *hayhurstii*, which we also possess from Missouri, Kentucky, Tennessee, Illinois and Florida.

As intimated by Skinner and Williams, the genitalia are the best characters on which to sort *ascalaphus* from *hayhurstii*. Aside from the genitalia, the characters given by Godman and Salvin, (Biol. Centr.-Amer. Lep., Rhop., II, 432) do not seem to hold. We note a greater difference between the sexes of *ascalaphus* than those of *hayhurstii*, the males averaging much darker, the females more contrasting.

WM. BARNES and F. H. BENJAMIN, Decatur, Illinois.

---

## An Interesting Parasite of a Praying Mantid (Dip., Orth.).

A female praying mantid, *Stagmomantis carolina* Johannson, was collected on a Yankee Weed *(Eupatorium capillifolium* Small) near Baton Rouge, Louisiana, Oct. 27, 1922. The day was cold, and the insect appeared affected by the low tempera-

ture and was supporting itself mainly by grasping the plant with its raptorial prothoracic legs. The abdomen was distended as if filled with eggs, but this seemed peculiar since practically all female mantids collected at this time had deposited their eggs. The mantid was placed in a wire cage with a branch of Yankee Weed.

The following morning the mantid was in the same place and in practically the same position as when placed in cage. It was then taken out of the cage and placed on a white-topped table in sunlight. The head and prothoracic legs moved as if insect were reviving. Watching it closely, it was noted that something was moving in the prothorax, and when the insect was held up to the light one could make out what appeared to be a maggot making its way back and forth in the tube-like prothorax.

In the afternoon the parasitized mantid was again inspected, and the head and legs seemed to move as if by muscular action. When it was held up to the light again it was noted that the internal structures had been eaten out of the head, prothorax, and from as far into the legs as the maggots could make their way. The movement of the legs was due to the maggots passing the joints, and when a maggot would crawl into the head it, too, would move. It was this movement of the head which caused the observer to think that the mantid was going to revive when placed in the direct sunlight.

The distended condition of the abdomen appeared to be that of a normally developed gravid female; so it appears that the parasitic maggots ate the ovaries and eggs.

At 4 P. M. the mantid was placed in a glass dish on damp sand, and covered.

On the morning of the 29th (8 A. M.) the body except legs, wings, and part of the prothorax had changed to a brownish black color. Ten maggots emerged from the body of the mantid at 9.30 A. M., coming out of the abdomen through an opening in the thin chitinous wall between two segments. In ten minutes all the maggots had entered the sand.

The maggots were examined from time to time during the winter months, and as late as May 15, 1923, none had pupated.

On July 11, 1923, three adult flies emerged and by July 16, 1923, seven more had emerged.

The flies were identified by Dr. J. M. Aldrich as *Sarcophaga flavipes* Aldrich. Since he does not record a host for this Sarcophagid in his monograph on the "Sarcophaga and Allies," the above may be a new record.—O. W. ROSEWALL, Louisiana State University, Baton Rouge, La.

## Diptera of the Older Authors Studied By American Entomologists.

Dr. Aldrich has been receiving for examination some types of Diptera of the older authors from the Vienna Museum in Austria. The fourth lot of these types has just been received and is being examined. The first two lots have been reported on in the *Annals of the Entomological Society of America*. Among the specimens received in these various lots are several which were collected about 100 years ago, and which formed a part of the collection of von Winthem, in Hamburg, where they were studied and described by the dipterist Wiedemann. In spite of their age, most of these specimens are well preserved. It appears that, as far as known, several of the species, including some very striking forms, have never been captured since that time, and are even yet represented only by the single original specimens. The privilege of borrowing these types is very highly appreciated. (Monthly Letter of the Bureau of Entomology, U. S. Dept. of Agric., No. 124.)

Apropos of the above it may be stated that Mr. Cresson, of the Academy of Natural Science of Philadelphia, has also been a recipient of the generosity of the Vienna Museum, by the loan of its entire collection of the dipterous family Ephydridae for study. The collection has been received in perfect condition and these microdiptera of the von Winthem collection are still in excellent preservation.

## Committee on General Entomological Terms.

At the Cincinnati meeting the Entomological Society of America appointed a standing committee "to recommend for adoption by the Society a preferred usage respecting such general terms as appear to be current in conflicting and confusing forms." It will probably be agreed that we ought to have some uniformity in regard to the usage of such terms as brood, generation, larva, nymph, incomplete, gradual or simple metamorphosis, correct singular and plural forms of exuviæ and a host of others that are continuously used in conflicting or confusing ways. It is believed that a good purpose would be served by a full discussion of these terms, and if possible, an agreement by all members of the society to follow some one usage for certain ones of them. All who are interested are urged to transmit their suggestions at once to one of the members of the following committee: E. M. Walker, Chairman, University of Toronto, Ontario; G. C. Crampton; W. M. Wheeler; A. L. Melander; and A. L. Quaintance.

## A Natural Freak (Coleop.: Coccinellidae).

A lady bug, or lady beetle, pierced by a pine needle, would seem nearly impossible under natural conditions, yet just such a specimen was sent to the State Entomologist of New York accompanied by the statement that the insect was alive when found and the needle attached to the twig. Moreover, this was on the top of an Adirondack Mountain near a cliff, remote from habitations, consequently this odd condition could not have been the work of children. An examination of the specimen showed that it had been neatly pierced by the pine needle, a portion, approximately one-quarter of an inch long, protruding from the under surface. There was no crushing or mangling, as would have been probable if the insect had been thrust upon the pine needle by a shrike. The neat entrance and exit of the needle and the color of the beetle showed that it had recently transformed. The probabilities are that the branch, swinging in the wind at the time the beetle was just issuing from the pupa, drove the somewhat old and stiff pine needle through the soft, developing insect and lifted it from an adjacent support. It is one of the curious accidents which might easily happen and generally escapes notice. A beetle transfixed in this manner might easily live several hours and possibly a day or two.

We have seen nothing of the kind before in spite of some thirty years' study of insect life. The victim of this odd accident was a fifteen-spotted lady beetle, *Anatis 15-punctata* Oliv.

E. P. FELT, Albany, New York.

---

## Junior Scientific Aid (Entomology).

The United States Civil Service Commission announces the following open competitive examination:

An examination for junior scientific aid (entomology) will be held throughout the country on January 7, 1925. It is to fill vacancies in the Bureau of Entomology, Department of Agriculture, at an entrance salary of $1,320 a year. Advancement in pay may be made without change in assignment up to $1,680 a year. The duties of the position include scouting, inspection, assisting in the application of insecticides, and general field laboratory work. Competitors will be rated on technical questions, and education and experience. Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil-service examiners at the post office or custom house in any city.

**Note on Megachile centuncularis (L.) Latr. (Hymen.: Megachilidae).**

In Smith's Brit. Mus. Cat. Hym. 1, 149, this bee is credited to North America, Hudson's Bay and Canada. In Dalla Torre's Catalogus Hymenopterorum **10**: 423-5, Putnam, Packard, Gentry and Provancher are cited as American references. In Trans. Acad. Sci. St. Louis **7**: 351, 1897, I have indicated *M. infragilis* as the male of *M. relativa,* described on the page preceding the former. In 1905 I received from Alfken a pair of *M. centuncularis* and since then have regarded *M. relativa* as the same. This species, cited as the type of *Anthemois,* is probably the type of *Megachile,* and to my way of thinking is the only local species belonging to that genus.—CHARLES ROBERTSON, Carlinville, Illinois.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of the American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **19**—Bulletin of the Brooklyn Entomological Society. **20**—Bulletin de la Societe Entomologique de France, Paris. **21**—The Entomologist's Record, London. **35**—Proceedings of the South London Entomological and Natural History Society, London. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **47**—Neue Beitrage zur Systematischen Insektenkunde. Ed. by G. P. Hummler, Voslau. **50**—Proceedings of the United States National Museum. **52**—Zoologischer Anzeiger, Leipzig. **57**—Biologisches Zentrallblatt, Leipzig. **68**—Science, Garrison-on-the-Hudson,

N. Y. **69**—Comptes Rendus des Seances de l'Academie des Sciences, Paris. **70**—Journal of Morphology, Philadelphia. **89** — Zoologische Jahrbucher, Jena. **91** — The Scientific Monthly, Lancaster, Pa. **99**—Bulletin du Museum National d'Histoire Naturelle, Paris. **106** — Anales de la Sociedad Cientifica Argentina, Buenos Aires. **111**—Archiv fur Naturgeschichte, Berlin. **114**—Entomologische Rundschau, Stuttgart. **116** — Entomologische Zeitschrift, Frankfurt a. M. **124**—Bulletin de la Societe Entomologique d'Egypte, Cairo. **128** — Zeitschrift fur Induktive Abstammungs und Vererbungslehre, Leipzig.

**GENERAL. Agersborg and Metcalf.**—A proposed biographical entomological dictionary. **68,** lx, 431. **Becquaert, J.**—Galls that secrete honeydew. **19,** xix, 101-34. **Davis, J. J.**—Principles of insect control. **4,** lvi, 203-6. **Lenz, F.**—Zur klarung der rassenfrage in der entomologie. (Mitt. Munch. Ent. Ges., 1923, 41-54.) **Lutz, A.**—A new method of enclosing and preserving small objects for microscopic examination. (A Folha Medica, i, No. 3, 14 pp.) **Lutz, A.**—Contribution aux methodes d'observations microscopiques et biologiques. (Ann. Biol. Lacustre, xi, 90-102.) **Morstatt, H.**—Bibliographie der pflanzenschutzliteratur. Das jahr., 1923. (Biol. Reichsan. f. Land-u. Forstw., Berlin, 176 pp.) **Prell, H.**—Ueber schutzrachten und mimikry **45,** xviii, 336-45. **Riley, N. D.**—Age and area and some Rhopalocera. **35,** 1923, 77-90. **Root, F. M.**—Parasitism among the insects. **91,** xix, 479-95. **Scholz, R.**—Zum praparieren kleiner kaefer. **124,** iv, 110-12. Cont. **Sherborn, C. D.**—Index animalium . . ., 1801-1850, Pt., 4, Bail-Byzos. **Turner, H. J.**—Nomenclature—1924. **21,** xxxvi, 111-14.

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC. Bathellier, J.**—Sur le developpement de Macrotermes gilvus, compare a celui de l'Eutermes matangensis. **69,** clxxix, 609-12. **v. d. Brelje, R.**—Die anhangsorgane des weiblichen geschlechtsganges der stechmucken. **52,** lxi, 73-80. **Cros, A.**—Emission d'un spermatophore par divers coleopteres. (Bul. Soc. Sc. Nat. Maroc, iv, 98-103.) **Dewitz, J.**—Experimentelle untersuchungen uber die verwandlung der insektenlarven. **89,** xli, Allg. Zool., 245-334. **Dobzhansky, T.**—Beitrage zur kenntnis des weiblichen geschlechtsapparates der coccinelliden. **45,** xix, 98-100. **Goldschmidt, R.**—Erblichkeitsstudien an schmetterlingen IV. Weitere untersuchungen uber die vererbung des melanismus. **128,** xxxiv, 229-44. **Hering, M.**—Der kopulationsapparat der schmetter-

linge. (Der Naturforscher, 1924, 254-66.) **Huettner, A. F.** —Maturation and fertilization in Drosophila melanogaster. **70**, xxxix, 249-66. **Kastner, A.**—Beitrage zur kenntnis der lokomotion der Arachniden. I. Araneae. **111**, 1924, A, 5, 1-19. **Meissner, O.**—Paralipomena dixippica. **116**, xxxviii, 33-34. **Muttkowski, R. A.**—Studies on the blood of insects. III. The coagulation and clotting of insect blood. **19**, xix, 128-44. **Oertel, R.**—Biologische studien uber Carabus granulatus. **89**, xlviii, Syst., 299-366. **Rethfeldt, C.**—Die viviparitat bei Chrysomela varians. **89**, Anat., xlvi, 245-302. **Ruschkamp, F.** — Instinktmodifikation in einer ameisenadoptionskolonie. **45**, xix, 176-8. **Schulze, R.**—Uber mycetophilidenlarven. **89**, xlviii, 433-62. **Schwartz, W.**—Untersuchungen uber die pilzsymbiose der schildlause. **57**, xliv, 487-528. **Stadler, H.**—Blutkiemen bei einer kocherbauenden Trichopterenlarve (Lasiocephala basalis). (Arch. f. Hydrobiol., xv, 250-2.) **Whiting, P. W.**—Defective and freak venation in the parasitic wasp, Habrobracon juglandis. (Univ. Iowa Studies, iii, 1-80.) **Wille, J.**—Die verschiedenen bewegungsarten des Rhipipteryx chopardi. **52**, lxi, 49-72. **Wixforth, E.**—Der herzschlag der culicidenlarven unter naturlichen und kunstlichen bedingungen. **111**, 1924, A, 5, 193-240.

ARACHNIDA AND MYRIOPODA. **Gerhardt, U.**—Weitere studien uber die biologie der spinnen. **111**, 1924, A, 5, 84-192.

***Bishop, S. C.**—A revision of the Pisauridae of the U. S. (New York Sta. Mus. Bul., No. 252, 140 pp.) ***Crosby and Bishop**—Notes in the Opiliones of the southeastern U. S., with descriptions of n. sps. (Jour. Elisha Mitchell Sci. Soc., xl, 8-26.)

THE SMALLER ORDERS OF INSECTA. **Ewing, H. E.**—Lice from human mummies. **68**, lx, 389-90. **Gotz, H. J.**—Zur nomenklatur der gattung Aeshna. (Mitt. Munchn. Ent. Ges., 1923, 37-39.)

**Handschin, E.** — Neue myrmecophile und termitophile Collembolenformen aus Sud-Amerika. **47**, iii, 13-28. **Longinus Navas, R. P.**—Insecta nova. Ephemeroptera, Paraneuroptera, Plecoptera. (Mem. Pont. Accad. Roma. Nuov. Lincei, vi, 1-27.) ***McDunnough, J.**—New N. Amer. Ephemeridae. **4**, lvi, 221-26. ***Snyder, T. E.**—A correction (in Nasutitermes). **10**, xxvi, 196. **Williamson and Williamson.** —The genus Perilestes (Odonata). (Univ. Mich., Mus. Zool., Misc. Pub., No. 14.)

**ORTHOPTERA.** **Hebard, M.**—The group Scyllinae as found in N. Am., with records and data on its occurrence in the U. S. **2,** l, 157-62.

**HEMIPTERA.** **Hoffman, W. E.**—Winter food for waterbugs in aquaria. **19,** xix, 149-50. **Olsen, C. E.**—Distributional notes on Hemiptera. (No. 2.) (Cicadellidae.) **19,** xix, 151-2. **Parshley, H. M.**—A note on Aradus debilis (Aradidae). **19,** xix, 145-6. **Parshley, H. M.**—General catalogue of the Hemiptera. **19,** xix, 154. **Torre-Bueno, J. R.**—Biological note on Plea striola. **19,** xix, 146.

**Ball, E. D.**—The correct names of the leafhoppers infesting the apple and potato. **12,** xvii, 594-600. ***Barber, H. G.**—The genus Arhaphe in the U. S. (Pyrrhocoridae). **4,** lvi, 227-8. **Lallemand, V.**—Notes sur les Cercopides de l'Amerique Centrale et Meridionale de la collection de C. B. Williams et de la mienne. **11,** xiv, 477-86. **Osborn, H.**—Neotropical Homoptera of the Carnegie Museum. (An. Carnegie Mus., xv, 383-462.) ***Robinson, W.**—A correction (in Erythroneura). **4,** lvi, 220. ***de la Torre Bueno, J. R.**—The Nearctic Rhagoveliae. **2,** l, 243-52.

**LEPIDOPTERA.** **Busck, A.**—The C. H. Fernald collection of lepidoptera. **10,** xxvi, 198. **Engelhardt, G. P.**—Eastern records for Tornos scolopacinarius. Field notes on western clear wing moths (Aegeriidae). **19,** xix, 124; 125-7. **Preece, W. H. A.**—Notes on the Sphingidae of Sault Ste. Marie, Ontario. (Can. Field-Nat., xxxviii, 132.) **Snodgrass, R. E.**—The tent caterpillar. (Smiths. Report, 1922, 329-62.)

***Barnes and Benjamin.**—The N. Am. and Greenland species of Sympistis. **4,** lvi, 212-15. **Dyar, H. G.**—Note on the larva of Thyris maculata. **15,** xii, 192-3. ***Heinrich, C.**—North American Eucosminae, notes and n. sps. (Jour. Wash. Ac. Sci., xiv, 385-93.) **Kohler, P.**—Fauna argentina. Th. I, Rhopalocera, 34 pp. (Sonderb. Zeit. Wissens. Insektenb., xviii, Heft 12.) **Le Cerf, F.**—Lepidopteres nouveaux de la collection du Museum (Rhopalocera). **99,** 1924, 137-39. ***Schaus, W.**—A new moth of the subfamily Phycitinae. **10,** xxvi, 196. **Seydel, C.**—Lymanopoda excisa decorata, subsp. nov. **47,** iii, 32. **Skinner and Williams.**—On the male genitalia of the Hesperiidae of N. Am., Paper VI. **2,** l, 177-208. **Stichel, H.**—Beitrage zur kenntnis der Riodinidenfauna Sudamerika. **45,** xviii, 305-16, xix, 160-61. **Stichel, H.**—Zur systematik der Riodinidae. **47,** iii, 1-3.

**DIPTERA. Schjelderup-Ebbe, T.**—Aufmerksamkeit bei mucken und fliegen. **116**, xxxviii, 31-2. **Turner, C. L.**—Breeding habits and mutations in the moth-fly (Psychoda). **68**, lx, 338-9. **Vaney, C.**—L'hypoderme du boeuf (Hypoderma bovis), ses degats, son evolution, sa destruction. (Rev. Gen. Sci., Paris, xxxv, 544-52.)

**Aldrich, J. M.**—Notes on N. Am. Tachinidae. **15**, xii, 145-9. **Aldrich and Weber.**—Change in preoccupied names. (Tachinidae.) **10**, xxvi, 195. **Bonne, C.**—The larva of Aedes (Ochlerotatus) eucephaleus and A. hortator. **15**, xii, 169-70. **Cole, Malloch and McAtee.**—District of Columbia diptera: Tromoptera (Cyrtidae, Bombyliidae, Therevidae, Scenopinidae). **10**, xxvi, 181-94. ***Cresson, E. T., Jr.**—Studies in the dipterous family Ortalidae, with descriptions of n. sps., mostly from N. Am. **2**, 1, 225-41. ***Curran, C. H.**—Some apparently new Canadian Psychodidae. **4**, lvi, 215-20. **Dyar, H. G.**—The male of Anopheles vestipennis, 171. Note on Aedes aloponotum and other species of its region, 176-9. The American forms of Aedes cinereus, 179-80. Notes on Aedes ventrovittis, 181-2. Some new mosquitoes from Colombia. II, 183-6. **15**, xii, 171-86. ***Dyar and Shannon.**—The American species of Uranotaenia, 187-92. Some new sps. of American Dixa, 193-201. The American Chaoborinae, 201-16. **15**, xii, 187-216. ***Dyar and Shannon.**—The American species of Thaumalidae (Orphnephilidae.) (Jour. Wash. Ac. Sc., xiv, 432-4.) ***Garrett, C. B. D.**—On British Columbian Mycetophilidae. II. **15**, xii, 159-69. **Malloch, J. R.**—Descriptions of Neotropical two-winged flies of the family Drosophilidae. **50**, lxvi, Art. 3. ***Van Duzee, M. C.**—A revision of the N. Am. species of the dipterous genus Chrysotus. (Bul. Buffalo Soc. Nat. Sci., xiii, No. 3, 1-53.)

**COLEOPTERA. Davidson, W. M.**—Observations and experiments on the dispersion of the convergent lady-beetle in California. **2**, 1, 163-75. **Hayes and McColloch.** — The biology of Anomala kansana (Scarabeidae). **12**, xvii, 589-94. **Lane, M. C.**—Simple method of rearing wireworms (Elateridae). **12**, xvii, 578-82. **Shepherd, D.**—Life history and biology of Echocerus cornutus. **12**, xvii, 572-7. **Verhoeff, K. W.**—Zur biologie der Lampyriden. **45**, xix, 79-88, Cont. **Wichmann, H. E.**—Ueber die geographische verbreitung der Ipiden. **52**, lxi, 14-18.

**Achard, J.** — Nouveaux Chrysomelini d'Amerique. **20**, 1924, 133-6. **Cotton, R. T.**—A contribution towards the clas-

sification of the weevil larvae of the subfamily Calandrinae occurring in N. Am. **50,** lxvi, Art. 5. **Hustache, A.**—Curculionides de l'exploration Lizer-Deleteng au chaco bolivien. **106,** xcvii, 267-84. **Portevin, G.**—Revision des Necrophorini du globe. **99,** 1924, 83-7 (cont.). **Schaeffer, C.**—On Casnonia picta and C. suturalis. **19,** xix, 147-8. **Zimmermann, A.** —Die Halipliden der welt. (Ent. Blatter, xx, 1-16. Cont.)

**HYMENOPTERA. Clausen, C. P.**—The parasites of Pseudococcus maritimus in California. Biological studies and life histories. (Univ. Cal., Tech. Bul., Ent., iii, 223-92.) **Criddle, N.**—Observations on the habits of Sphex procera in Manitoba. (Can. Field-Nat., xxxviii, 121-3.) **Enslin, E.**—Ueber blatt-und holzwespen. **114,** xli, 33-5. Cont. **Hayes, W. P.**—Two mutillids hyperparasitic on white grubs. (Scarabeidae). **19,** xix, 153. **Herbst, P.**—Beitrage zur biologie der chilenischen arten der gattung Centris. **45,** xviii, 345-50. **Lutz, F. E.** — Hunting stingless bees. (Natural Hist., N. Y., xxiv, 495-508.) **Reinhard, E. G.**—The life history and habits of the solitary wasp, Philanthus gibbosus. (An. Rep. Smiths. Inst., 1922, 362-76.) **Wasmann, E.**—Die larvenernahrung bei den ameisen und die theorie der trophallaxis. (Mem. Pont. Accad. Roma. Nuov. Lincei, vi, 67-87.)

***Timberlake, P. H.**—The parasites of Pseudococcus maritimus in California. (Univ. Cal., Tech. Bul., Ent., iii, 223-92.)

## SPECIAL NOTICES

**The Macrolepidoptera of the World,** Fauna americana, Parts 151-152, English edition. The American Agaristidae are completed and the family Noctuidae is introduced.

# OBITUARY.

DR. CLARA SOUTHMAYD LUDLOW died in Washington, D. C., September 28, 1924. She was born at Easton, Pennsylvania, December 26, 1852, received the degree of B. S. in 1900, and of M. S. in 1901, from the Mississippi Agricultural College. In 1908 George Washington University gave her the degree of Ph.D., her thesis being on *The Mosquitoes of the Philippine Islands: The Distribution of Certain Species and Their Occurrence in Relation to the Incidence of Certain Diseases* (65 pages). Her earliest studies on the mosquitoes of these islands

appeared in the *Journal* of the New York Entomological Society for 1902 and 1903, and were continued in the *Canadian Entomologist* (1904, 1909) and *Psyche* (1911). Other papers on the Culicidae appeared in the *Canadian Entomologist* from 1904 to 1910, in *Psyche* from 1914 to 1920, and, in association with Dr. H. G. Dyar, in *Insecutor Inscitiae Menstruus* in 1921 and 1922. Her most extensive work was *Disease-bearing Mosquitoes of North and Central America, the West Indies and the Philippine Islands* (Bulletin No. 4, office of the Surgeon General, War Dept., Washington, 1914, 97 pages, 27 plates).

Dr. Ludlow was demonstrator of Histology and Embryology from 1907 to 1909, and instructor from 1909 to 1911, in George Washington University; lecturer on mosquitoes and disease, 1904 to 1910, anatomist 1916 to 1920 and entomologist from 1920 to her death, in the Army Medical Museum, Washington.

P. P. CALVERT.

---

Professor WILLIAM ALBERT LOCY, head of the Department of Zoology at Northwestern University, Evanston, Illinois, died on October 11, 1924. He was born at Troy, Michigan, September 14, 1857, received the degrees of B. S. in 1881, of M. S. in 1884, and of honorary Sc. D. in 1906, from the University of Michigan, and of Ph. D. from the University of Chicago in 1895. He was professor of Biology at Lake Forest College from 1887 to 1889 and of Animal Morphology in the same institution from 1889 to 1896, in which latter year he went to Northwestern. In 1884 he published on the *Anatomy and Physiology of the Family Nepidae* (Hemiptera) in the *American Naturalist,* and in 1886 *Observations on the Development of Agelaena naevia* (Spider) in the *Bulletin* of the Museum of Comparative Zoology. His chief work, however, concerns the morphology and embryology of vertebrates. In later years he turned his attention to the history of zoology and his *Biology and Its Makers* (New York, Holt, 1908, third edition, 1915) and *Main Currents of Zoology* (same publisher, 1918) contain much of interest to the entomologist. He was president of the American Society of Zoologists in 1915. P. P. CALVERT.

# INDEX TO VOLUME XXXV.

(*denotes *new* genera, species or varieties)

## GENERAL SUBJECTS.



## OBITUARY NOTICES



## PERSONALS.

## REVIEWS.



## GEOGRAPHICAL DISTRIBUTION.



## ARACHNIDA.

## COLEOPTERA.



## DIPTERA.

## HEMIPTERA.

## LEPIDOPTERA.

## ODONATA.



## ORTHOPTERA.



## PROTURA.



## THYSANOPTERA.

| Date of issue. | Date of issue. | Date of issue. |
|---|---|---|
| | | |